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JUL 21 1937

FLIGHT

The AIRCRAFT ENGINEER AND AIRSHIPS

1489 XXXII

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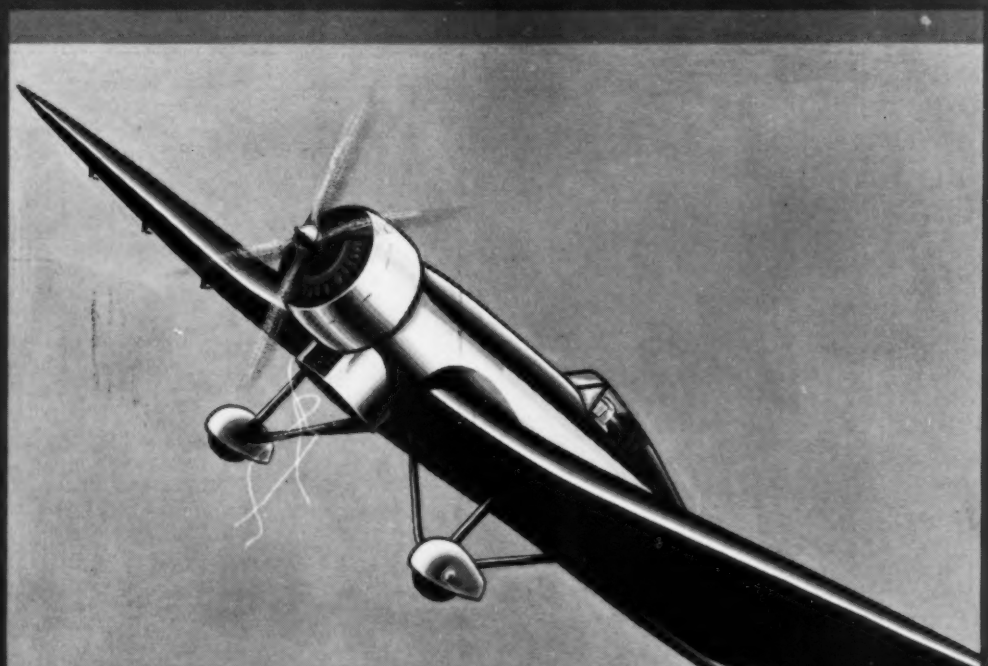

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FLIGHT

The AIRCRAFT ENGINEER AND AIRSHIPS

FIRST AERONAUTICAL WEEKLY IN THE WORLD : FOUNDED 1909

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Over the Oceans

THE trying ordeal which Mrs. Amelia Putnam has experienced reminds us that flying across an ocean is not yet as simple a feat as flying the English Channel. Nevertheless, there is a great difference between the Atlantic and the Pacific. In the larger ocean one must search for a tiny island, and to find it requires extraordinarily accurate navigation. If some small error creeps in to the calculations, the island becomes as difficult to find as the proverbial needle in a haystack. Missing the island almost inevitably means exhaustion of petrol and a descent on the water and a lot of trouble and expense for the people who hasten to the rescue.

On the Atlantic, between Ireland and Newfoundland, no such problems arise, for the flight must be non-stop from one country to the other. Farther south navigators have not yet made mistakes large enough to involve missing the Azores or Bermuda. It may be remembered that Col. Lindbergh worked out his course for his first flight across the Atlantic by saying that, even if he made an error, he was sure to hit Europe between Ireland and Portugal.

To Schedule

Not quite so much latitude could be allowed the *Caledonia* and the *China Clipper*. Though their flights were the first of a series, they had to be flown with the accuracy of a mail service. They were, in fact, the first Atlantic flights to be undertaken, not as mere adventures or as a form of publicity, but with a serious commercial object in view. The way in which both have been carried out according to schedule speaks well for the technical success of the new enterprise. More data will naturally be accumulated as the series of flights proceeds, but already there seems no reason to doubt the ability of the modern aeroplane to cross the Atlantic with safety and considerable regularity. Whether a passenger service can be made to pay remains to be seen.

Higher and Higher

FLT. Lt. M. J. ADAM and the Bristol Aeroplane Company deserve and have received the heartiest congratulations from all sides on the great flight of June 30 which regained for Great Britain the world's altitude record for aeroplanes. Certainly the aeroplane has not yet climbed as high as the balloon has done, but the problems are quite different; the objects of the two efforts are likewise diverse, and there is no point in making comparisons between them. The object of a balloon ascent into the stratosphere can only be to collect information about cosmic rays and similar problems; the main object of the international rivalry in aeroplane altitude flights is to produce the most suitable engine for the task. That implies a complete set of problems apart from any scientific observations which may be made when the aeroplane is in the stratosphere.

The hero of the aeroplane altitude flights is the Pegasus engine. Certainly let us honour the names of Uwins, Swain, and Adam, but it is the Pegasus to which the chief honours must be awarded. It was the Pegasus which made possible the flights over Mount Everest by Lord Clydesdale and Flight Lieutenant (now Squadron Leader) McIntyre. It was the Pegasus which, in an almost standard Vickers Vespa, first brought the altitude record to Britain. It was a Pegasus in a Caproni, flown by Commander Donati, which took the record over to Italy, and it is a special Pegasus in the Bristol 138 aeroplane which has twice brought that record back to Britain.

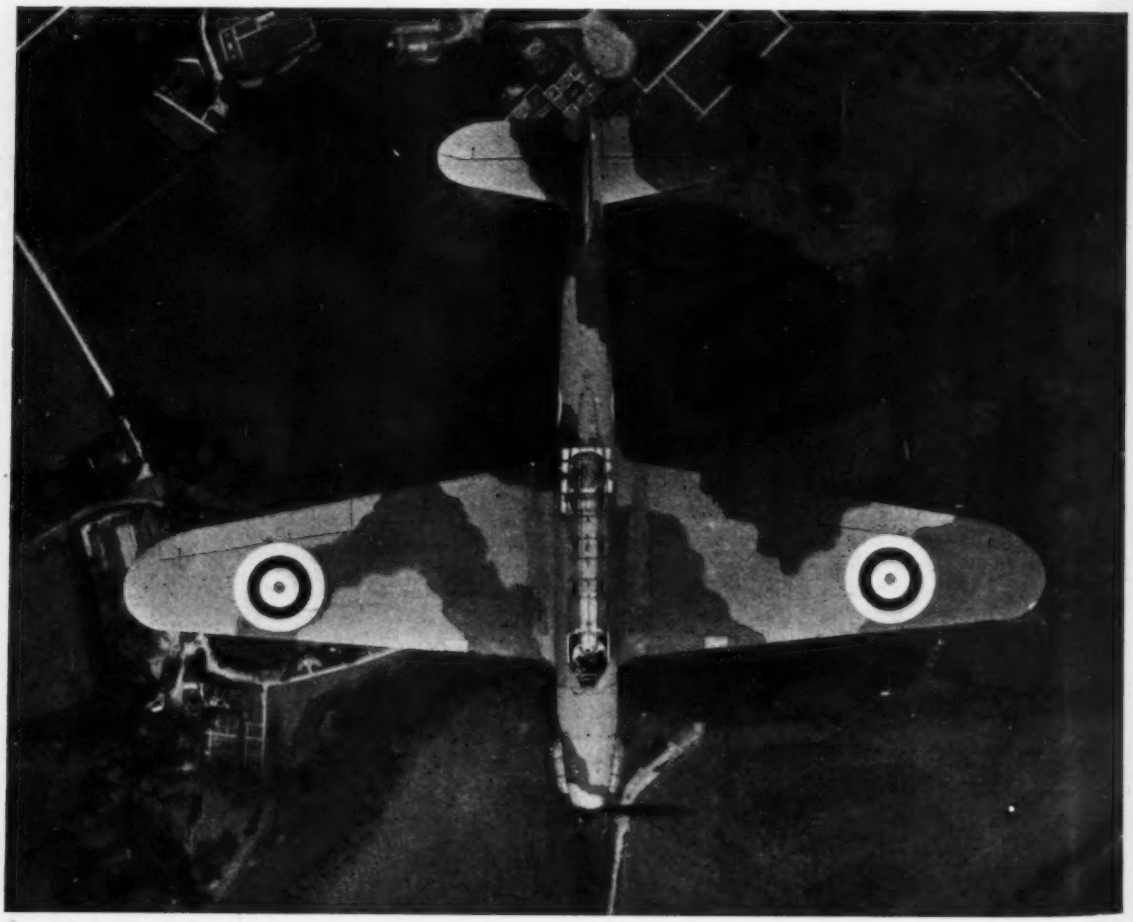
Records have both an unseen value and a concrete value. The prestige which the possession of a world's record brings to a country is reflected in a number of ways, one of which is increased value of aeronautical exports. It may even add weight to the word of that country at an international conference. Certainly it makes taxpayers more willing to support the country's Air Force when they are assured that the designers are capable of providing machines of real class. The concrete advantages which come as the result of experiment

and research are even more valuable. If Britain had not decided in the years 1927-31 to win the Schneider Trophy and to keep it, should we now be able to boast of a Spitfire fighter? Where the winning of the altitude record will take us cannot yet be foreseen. It may mean that future travellers will hurtle through the stratosphere at 600 m.p.h. when they seek a week-end of sunshine at Capetown.

That thought naturally takes us to consideration of another sort of record, namely, long distance. Only once has Britain seriously prepared to attack that record, and then Squadron Leader Jones Williams and Flight Lieutenant Jenkins were killed in the Atlas mountains. The creditable flight by Squadron Leader Gayford to Walvis Bay can hardly be called a serious attempt, for when it was made the Fairey monoplane was a design several years old. A long-range aeroplane was ordered from the Bristol Company at the same time as the altitude machine, but, in view of all the work which the company had in hand, the long-range machine has not been produced. Meantime the Vickers firm has produced the Wellesley. It has been ordered in numbers as a medium bomber, but, fitted out with extra tanks, it is understood that it could fly non-stop for seven thousand miles. A very optimistic calculation has mentioned eight thousand as not beyond the bounds of possibility. If the Air Ministry decided to attack the long-range record, there would be no need to spend time and money in designing a special machine. It would only mean adding one more Wellesley to the order and fitting it out with special long-range equipment.

The present record made by the French pilots Codos and Rossi from New York to Rayak stands at 5,657.387 miles. If the Wellesley were to be content with a range of a mere 7,000 miles it could easily beat the standing record. A flight from England to either Capetown or Hong Kong would hardly be a real test, for neither of them is much over 6,000 miles distant. If, however, one takes the higher figure of 8,000 miles as a possibility, it becomes difficult to find a course of that distance with both termini in the British Empire. From London to the Falkland Islands is one, though not an inviting one. From Singapore to Sierra Leone is another, crossing Ceylon, Aden, the Sudan, and the Sahara. Yet a third, and quite an interesting route, is from Vancouver to Ceylon via Alaska, Mongolia, and Tibet.

When using an existing machine for record-making, one cannot plead that lessons are being taught by the research entailed, but when a record is within reach it seems a great pity not to grasp it. The cost would be little, and the prestige which it would bring would be great.



THE MIMIC : A striking *Flight* photograph of the production Fairey Battle, with Flt. Lt. Christopher Staniland in charge,, demonstrating the purpose of camouflage. This and the view on page 49 are the first aerial photographs of the production Battle.

The Outlook

A Running Commentary on Air Topics

Ocean Responsibility

AS this week's issue of *Flight* is about to go to press, the latest news about Mrs. Amelia Earhart Putnam and her navigator, Captain Noonan, is that a British vessel is hurrying to the spot where the aeroplane is believed to be resting on a small reef. One is justified in hoping that the ship will be in time and that the gallant little lady and her companion will be restored to their respective families. Mrs. Putnam has, like her compatriot, Charles Lindbergh, made many good friends in England during former visits, not only on account of her personal charm but even more because she has never offered high-flown explanations of "missions" or "scientific explorations" to account for her hazardous flights. When she had flown solo across the Atlantic she merely said, "I always thought I was capable of doing it, and had a try to see if I was right." It is quite impossible to quarrel with a risky, or even foolhardy, undertaking if it is approached in that spirit.

There is, however, another side to this question of hazardous flights. In whatever spirit such a flight is undertaken, and no matter how excellent the equipment, there is always a risk of something going wrong. The moment that happens the adventure ceases to be a purely private and personal one, and becomes the business of the whole world. Consequently, one cannot let personal feelings influence one's opinions of the larger general questions involved.

The fact that in the case of Mrs. Putnam and Captain Noonan it so happened that most of the vessels told off to search for them were American does not alter the general case of vessels of all nationalities having to be diverted from their courses and their own lawful occasions, often at very considerable cost to the shipping companies. It is almost unreasonable that humanitarian considerations should compel such action to be taken, irrespective of the degree of foolhardiness with which the adventure which called forth the necessity for rescue was begun.

We do not regard Mrs. Putnam's attempted flight around the world as by any means one of the most hazardous of its kind, and so our remarks are in no way directed against her adventure in particular, but when a pilot who has won world fame comes to grief it is inevitable that the broad general principles involved should be raised.

Royal Recognition

IT was, of course, no mere coincidence that at the R.A.F. Display several representatives of the aircraft industry were presented to His Majesty. This was the Coronation Display, and King George VI has, since the time, shortly after the war, when he learned to fly, taken a keen interest in aviation and in the R.A.F. That he should have taken the very first opportunity after his Coronation to meet representatives of the British aircraft industry is not only a source of gratification, but may be taken as an excellent omen for the future. His Majesty had previously met almost the whole of the aircraft industry when, as Duke of York, he was the guest of honour one evening some years ago at the annual dinner given by the A.I.D. Technical Staff Association to representatives of the aircraft world. The presentation at the R.A.F. display this year is an indication that the King realises to the full the Imperial importance of the industry whose members he met so informally as Duke of York, and from that fact one may view hopefully the future of British air defence.

Members of the aircraft industry who had the honour of being presented to His Majesty included Mr. F. Handley Page, one of the pioneers of British aviation and chairman of the S.B.A.C.; Mr. A. F. Sidgreaves, managing director of Rolls-Royce, Ltd., and a vice-chairman of the S.B.A.C.; Capt. F. S. Barnwell, another pioneer aircraft designer, whose Bristol products have been famous since the early days; Mr. A. Gouge, chief designer and general manager of Shorts, whose flying-boat work has received world-wide appreciation; and Mr. Sydney Camm, for many years chief designer to the Hawker company, whose products have for long formed such a very large percentage of the equipment of the Royal Air Force.

All were impressed by the knowledge of flying subjects which His Majesty displayed and charmed by the unassuming reception which they were given by the King and Queen.

Great Minds . . .

EVER since man began to think for himself he must have dreamed of the possibility of imitating the birds. From the days of Leonardo da Vinci up to the present time very little progress has been made along the road to the realisation of this dream. Every now and then some inventor produces a scheme, but one and all have been found impracticable when it came to working out the almost innumerable details. The failures have usually been traceable to two main causes: unfamiliarity with aerodynamic theory and unscientific application of the necessary mechanism.

By a somewhat curious coincidence *Flight* has, during the last few days, come across two cases of men whose technical abilities cannot be questioned having arrived at the conclusion that flight by human power is possible, theoretically, at any rate.

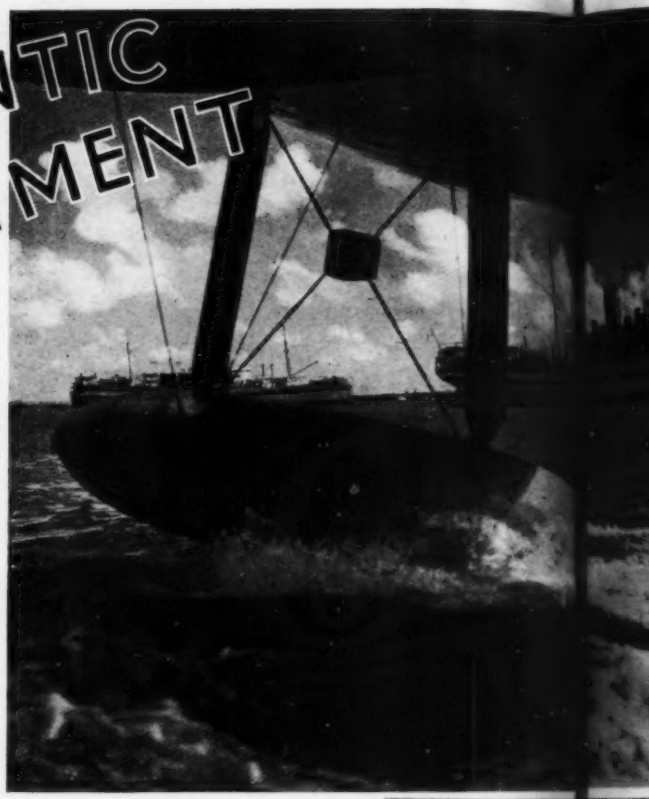
Mr. H. C. H. Townend, D.Sc., F.R.Ae.S., the inventor (or should one say discoverer?) of the Townend ring, among other things, in a note published in the July issue of the *Journal* of the R.Ae.S., draws attention to a few facts which, as he says, "suggest that, from a purely aerodynamic point of view, the difficulties involved in flight by human power may not be as great as is generally supposed." Lanchester, in his great work, *Aerodonetics*, gives an account of aerodynamic soaring, and the so-called "Knoller-Betz" theory has been known to aerodynamicists for many years, as has also the so-called "Katzmayr effect," which depends upon an air stream caused to oscillate past a fixed aerofoil. Mr. Townend deduces from these experiments, and from views expressed by well-known glider pilots, that the small amount of power necessary for changing the sloping glide path of an efficient glider into a horizontal flight path may be within the ability of man to furnish.

A few days ago we received from Mr. Granville Bradshaw an article describing tests he has made which lead him also to believe that flight by human power is feasible. For Mr. Bradshaw's arguments we must refer readers to next week's issue of *Flight*, but in the meantime it might be recalled, for the benefit of the younger generation, that Mr. Bradshaw designed and produced successful aero engines before the War, so that his technical qualifications for expressing his views on the subject cannot be held in doubt. The article will certainly cause controversy, but we believe our readers will be intensely interested.

DIARY OF FORTHCOMING EVENTS—PAGE 48.

Some Facts that Spelled Success in a—

TRANSATLANTIC EXPERIMENT



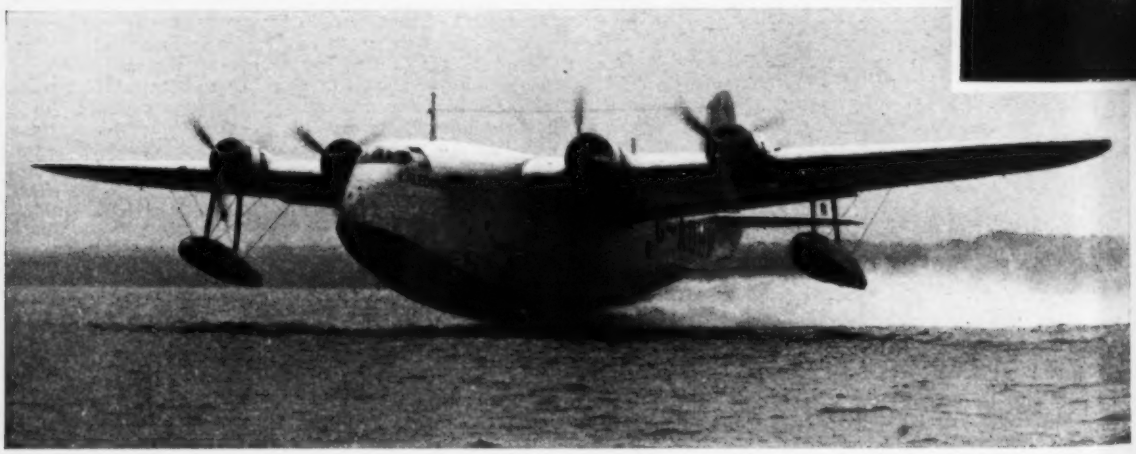
The Navigational Preparations and Problems Behind "Caledonia's" Notable Atlantic Test Flight

By H. A. TAYLOR

ON the evening of July 5, last Monday, *Caledonia*, one of Imperial Airways' Short boats laid out for transatlantic experiments, left Foynes, I.F.S., for Botwood, Newfoundland, on its first experimental Atlantic crossing. The crew consisted of Capt. A. S. Wilcockson, the commander, First Officer C. H. Bowes, Wireless Operator T. E. Hobbs, and Mr. T. A. Vallette, a radio expert seconded from the Marconi Company to Imperial Airways for the experiments. The machine duly arrived at Botwood fourteen hours later. Further details of this historic flight are given at the end of this article.

The problems involved in accurate navigation over a distance of nearly 2,000 miles out of sight of land are quite considerable, but they can be solved with accuracy by a pilot with the resources of such a boat as *Caledonia* at his command. They are tackled by three different, though complementary, methods—dead reckoning, direction-finding radio and celestial observations. In very simple terms dead reckoning provides a permanent check so long as the pilot has a general idea of the wind velocities and directions prevailing over the route; while D/F and astronomical observations give him definite bearings or positions at necessary intervals.

We who make our miserable little journeys of a few hundred miles plot our track in relation to magnetic north (allowing a vague sort of "12 degrees" for magnetic variation after measuring the angle of our track against a convenient meridian) and calculate a course to steer after learning that the wind at 2,000ft. is "250 deg., 22 m.p.h." The variation may change by a degree or two over an east to west flight and the wind may, in fact, be blowing from 220 degrees at 18 m.p.h., but the difference at the point of arrival is a matter of a mile or so, and we have



A remarkable photograph of *Caledonia* taken just as she was about to "unstick" at the start of a radio test flight from Southampton Water shortly before leaving for Foynes, and, ultimately Newfoundland

checked our position against familiar landmarks from time to time. Capt. Wilcockson had no landmarks, but, instead, he had short, intermediate and medium wave two-way radio sets, a rotating loop, two compasses, automatic pilot, a bubble (or artificial horizon) sextant *and* a chart table. Ship's captains have no more, yet it is customary for the *Queen Mary* to make accurate landfalls.

Between Foynes and Botwood the magnetic variation, or difference between the true and magnetic north (lying somewhere in Baffin Land), increases from 16 deg. to about 32 deg. If, in still air, a pilot made the necessary allowances, minute by minute, to his compass course, he would arrive at Botwood in due time and without possible failure. Unfortunately, adjustments must be made for changing wind speeds and directions; furthermore, the pilot in this case would not be travelling by the shortest route. In fact, however, the difference between the rhumb line, or constant true bearing course and the great circle, or "straight line" course over this particular route is not really worth worrying about. Very accurate work on a great circle track, with regular magnetic course alterations to suit, would save a matter of twenty-five miles or less—and *Caledonia* would arrive just ten minutes earlier at Botwood.

Temporary Irish base : A view of the harbour and village of Foynes, on the south side of the Shannon Estuary.

Since a rhumb line course carries the machine nearer the steamer tracks the advantages of flying with academic efficiency on the shortest possible route are more than outweighed. While the proximity of shipping may provide a certain amount of moral support, the real advantages of being near to these regular tracks are that radio information may be obtained and, more important, radio bearings may be taken. Unless the boat is very badly off course, bearings from Ireland and Newfoundland will be almost reciprocal and a third bearing will be necessary to obtain a "cut" in order to estimate the machine's position with any real accuracy.

***Caledonia's* Crew : From left to right they are Mr. T. E. Hobbs (Wireless operator), Mr. T. A. Vallette, seconded from Marconis, First Officer C. H. Bowes and Capt. A. S. Wilcockson, who is in command.**

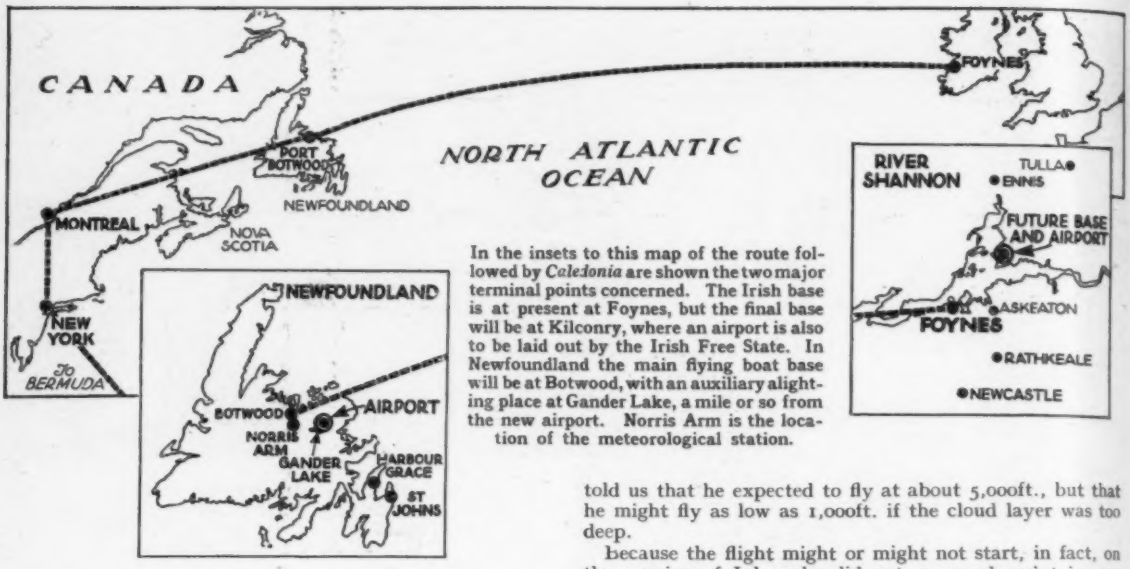
Compromise, in this case, provides the best solution in the matter of dead reckoning. By steering on 290 deg. magnetic, Capt. Wilcockson would have allowed too much for variation over the first half of the journey and too little over the second half. The result of flying on this course—suitably modified according to meteorological information—is to provide a track somewhere between the rhumb line and great circle tracks. This useful effect is largely limited to this particular part of the northern hemisphere.

During the past six months or more an Air Ministry meteorologist has been travelling to and fro on the merchant ship *Manchester Port*, other ships have made regular reports, and the met. people have been at work for a long period in the Shannon and Botwood areas. Theoretically, therefore, the knowledge of upper air and surface conditions over the North Atlantic should be sufficient for a dead reckoning flight to be made with safety and efficiency.

Radio Equipment

That, however, is only a small part of the story. It will be remembered that the Marconi equipment on all the Empire boats includes medium and short wave two-way sets and a loop aerial for medium-wave direction finding. That in *Cambria* and *Caledonia* is a development of this. At both Botwood and on the Shannon there are examples of the recently developed short-wave direction-finding systems (described in *Flight* this week).

During the experimental Atlantic flights it is probable that watch at these two points and on the boat will normally be kept on a common wavelength of 900 m. (333 kc/s), while the short-wave equipment will be used mainly for long-range direction finding. The crew of the boat will use their own loop aerial for obtaining bearings from different ships, the radio operators on which will, of course, need to report their own positions. These will be necessary for obtaining regular fixes. In any case, it will be possible for the boat to obtain bearings—and, consequently, the angle of drift—from the Botwood and Shannon stations. It is, however, very important that the crew should know exactly where they are *all* the time; the strength of signals provides only a very rough guide of the distance from the transmitter, but, if the machine was homing on Botwood, the bearings would, of course, be reversed as the machine crossed over the station itself in due time.



In the insets to this map of the route followed by *Caledonia* are shown the two major terminal points concerned. The Irish base is at present at Foynes, but the final base will be at Kilconry, where an airport is also to be laid out by the Irish Free State. In Newfoundland the main flying boat base will be at Botwood, with an auxiliary alighting place at Gander Lake, a mile or so from the new airport. Norris Arm is the location of the meteorological station.

Caledonia, in fact, carries Marconi radio equipment which is necessarily even more flexible than that used on the standard Empire boats. In addition to transmitters working between 500 and 1,000 m. (for approach work on this side), between 95 and 185 m. (for long-distance and approach work on the American side), and between 16.5 and 75 m. for general long-distance communication, she will carry a receiver for work covering the wavebands of 15-100, 183 and 600-2,000 m. with direction-finding circuits incorporated in the 600-2,000 m. waveband and a stand-by receiver working between 180-2,000 m. which will be additionally useful for obtaining bearings on the U.S. broadcast stations which transmit on the 200-400 m. band.

Celestial Navigation

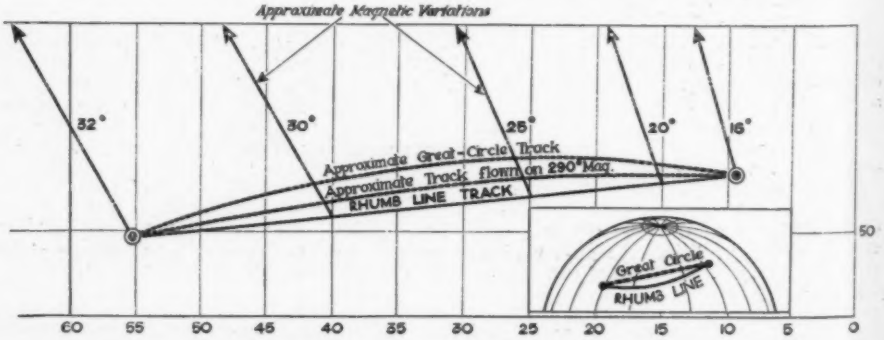
Anyone who has spent half an hour or so in the plotting room of an airport radio station will know how a very slight error in one bearing of three can, in certain circumstances, make a very big difference to the estimated position of an aircraft. In this case the bearings obtained from the land stations will, as already explained, be almost reciprocal, and the accuracy of a fix will depend on bearings obtained from shipping and the U.S. broadcast stations on *Caledonia's* own D/F loop. However accurately these bearings may be plotted, there is always the far chance that the ship's estimation of her own position, in latitude and longitude, will be in error, this adding a further source of difficulty.

For this reason, if for no other, Capt. Wilcockson hopes to have the chance of using a bubble sextant either by day or by night at reasonably regular intervals. Whether this will be, or has been, possible will depend on the sort of weather conditions encountered. A fortnight ago he told us that he expected to fly at about 5,000ft., but that he might fly as low as 1,000ft. if the cloud layer was too deep.

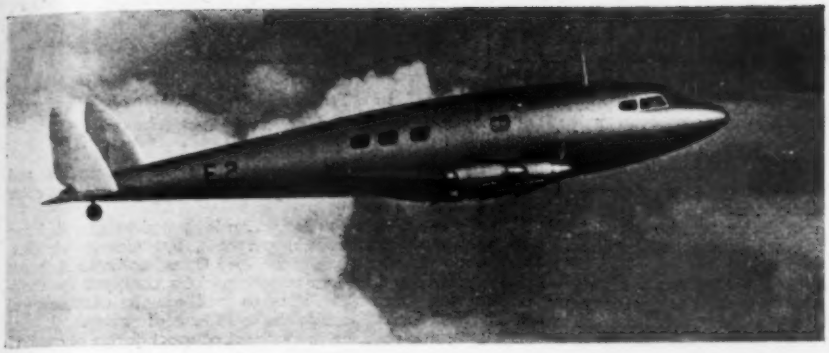
Because the flight might or might not start, in fact, on the evening of July 5 he did not see much point in pre-calculating various celestial altitudes at different times, but, with the help of an abridged Nautical Almanac, and azimuth tables, such calculations could easily be made just before the boat left. In whatever manner the work was carried out, the fact remains that a properly adjusted sextant can be used to provide a fix of extraordinary accuracy. *Caledonia* should give as stable a platform for the work as any other machine that has been built.

For most economical all-round operations *Caledonia* cruises at about 150 m.p.h., but the actual amount of throttle naturally depends entirely on the speed and direction of the winds prevailing during the flight. With a very strong wind against her it would probably pay to increase the engine revolutions and so use more fuel per hour but less per mile. At any rate, *Caledonia* carried ample fuel for any reasonable eventuality. Since no human pilot can fly on course as accurately as one of the automatic variety, the Sperry does most of the work once the machine is on its way—readjustment being made in customary manner every twenty minutes or so.

Needless to say, much larger boats will be used when passengers are ultimately carried across the Atlantic, but it is probable that the Short Empire type will still be used for the first mail crossings. Meanwhile, experiments will be made with both landplanes and an "initially assisted" floatplane before a decision is finally reached. At present it would seem that the landplane, typified in the D.H. Albatross, two of which have been ordered by the Air Ministry, is the most likely machine for eventual mail crossings over the North Atlantic. The "initially assisted" experiment is, of course, the Mayo composite, in which a modified Short boat is used to lift a smaller and



The three possible tracks — great-circle, constant magnetic course and rhumb line — are here shown diagrammatically as they appear on Mercator's projection. The approximate magnetic variations over the crossing are also shown, while (inset) there is a diagram to indicate the layout of the rhumb line and the great-circle tracks as they appear on a globe.



(Left) One of the two D.H. Albatross machines which have been ordered by the Air Ministry for transatlantic experiments. Their normal cruising speed is in the region of 210 m.p.h. at 10,000 ft.

Below is a photograph of a model of the Mayo composite, in which a modified Short Empire boat is used to lift a smaller, heavily loaded floatplane into the air.

proportionately more heavily loaded machine into the air, where the latter will be released.

Agreements between the Governments of this country, Canada, the Irish Free State and Newfoundland are such that a joint operating company comprising British, Canadian and Irish companies has the sole rights of using the I.F.S. and Newfoundland for Atlantic flights during the next fifteen years. In exchange for reciprocal landing rights the American company, Pan-American Airways, will also be granted similar facilities. France and Germany, however, will not be able to use these jumping-off points, and this fact may prevent these countries from going ahead in the near future quite as rapidly as they might otherwise do.

Whatever one might feel about the matter, such is business, and it would certainly seem that an Atlantic airline is likely to be of greater value to the United States and ourselves. It remains to be seen whether Germany and France will, in turn, manage to prevent us from using the Azores, which belong to Portugal, for winter operations.

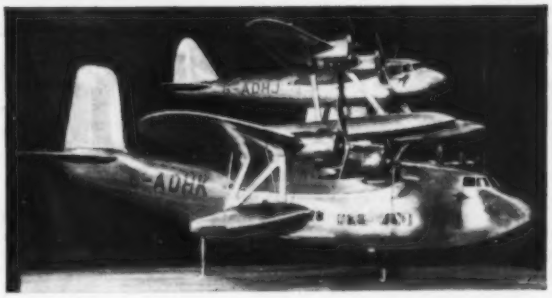
Germany and France

Of these two countries, Germany has already carried out very successful experimental flights, with the help of a supply and catapult ship, over the North Atlantic, using a diesel-engined Dornier boat, and on one of these a non-stop flight was made from the Azores to Port Washington, New York. D.L.H. have now a new catapult ship in commission, the *Friesenland*, which has been built specially for the purpose (see *Flight* of June 24) and a large diesel-engined floatplane, the Blohm and Voss, may also be carrying out trial flights this summer. At any rate, Germany, with her experience over the South Atlantic, can be considered as a very serious worker in this field.

France, also, experienced in long-distance ocean work, has not yet shown what she can do over the North Atlantic, but a special company has been formed, Air France Transatlantique, and surveys have been made in the Azores. Like ourselves, France has both landplanes and flying boats as likely starters. The four-engined Farman 2231 (Hispano-Suiza 12 Xs), which has been specially built for the North Atlantic trials, has recently made its first flight, and is reported to have surpassed 250 m.p.h. and to have given every satisfaction. It was Air France's entry in the now abandoned New York-Paris air race, and is a close relation to the 40-seater Farman 220, which is still undergoing tests preparatory to being put on Air France's London-Paris-Marseilles service.

America has a big Boeing boat in course of construction and a great deal of experience on the Pacific run. Though the weather conditions on that route are very different from those prevailing over the Atlantic very useful long-distance navigation experience should have been gained during the past year.

For the initial Atlantic experiments Pan-American Airways are using a specially tanked Sikorsky S.42.B, and this machine left Botwood at 10.10 p.m. (B.S.T.) on the evening of July 5—two hours after *Caledonia* had left Foynes.



She was commanded by Capt. Harold Gray, with First-Officer W. de Lima, Second Officer W. Masland, and four others making up his crew. The 42B made the crossing without difficulty in 12h. 34m. at an average speed of 156 m.p.h.

Caledonia left the water near Foynes at 7.57 p.m., and arrived over Newfoundland 15 hr. 3 min. afterwards. Her average speed worked out at 132 m.p.h.—which can be considered as excellent when it is remembered that she had an unfavourable wind with which to contend. Incidentally, it appears that the often-maligned meteorologists worked out a most accurate weather chart; conditions appeared during the journey just as they had been forecast. Well, it is the meteorologist who is to be the eventual conqueror of the North Atlantic. Without almost supernaturally accurate forecasting no regular service can ever be maintained.

In the meantime we must congratulate the respective crews of the two pioneer boats. Everything appears to have gone off with the clockwork precision which always gives confidence to the men and women who will send their letters and eventually travel by air across this 2,000-mile stretch of ocean.

Radio for Ronaldsway

TO-DAY the new D/F station at Ronaldsway, I.O.M., starts operations. The frequency is 363 kc/s (826 m.) and the call sign is GJE.

Meanwhile a second channel, employing the same frequency, has also been opened at Barton, Manchester, and a new communications area has been established to cover this and the I.O.M. station. The area concerned is bounded by the coast between Holyhead and Aberdovy, a line between the latter and Speke, the coast round to Port William and the Mull of Galloway, a line to a point twenty miles S.E. of Cranfield Point, and another thence to Holyhead.

The 363 kc/s frequency should be used by machines bound for, or departing from, the Island while in the area, and by machines operating between areas within the area. Others should work on the normal Manchester channel—i.e., 348 kc/s (862 m.) and 346 kc/s (867 m.).

On the same date a controlled zone was instituted at Ronaldsway, consisting of an air space up to 3,000ft. and over an area bounded by a circle of ten miles radius with its centre at the airport.

CORRESPONDENCE

The Editor does not hold himself responsible for the views expressed by correspondents. The names and addresses of the writers, not necessarily for publication, must in all cases accompany letters intended for publication in these columns.

RUNNING FIX

YOUR correspondent's method of plotting a running fix (p. 28, *Flight*, July 1) is good and accurate, but not, of course, new. In the normal course of air navigation the deft use of a ruler or scale against the bearings is generally considered to be quicker and equally accurate.

It would be interesting, however, to time the two methods—always remembering that, as machines become larger, there will be more room for serious chart work. At present the use of anything but a C.D.C. for such a problem is confined to examination rooms, though we must not forget that the object of an examination is to check the extent of a student's basic understanding. Short methods should only be used after fundamentals have been grasped.

I find myself able to laugh with a clear conscience both at the rule-of-thumb veterans and at the theorists. Normal flying would not be possible without the first-named, but the latter are coming into their own as non-stop runs lengthen and as transport pilots are expected to fly in thicker weather.

London, N.6. ONLOOKER.

AIR AMBULANCES FOR SPAIN

MAY I draw attention to the paragraph under the above heading on page 591 of your issue of June 17 last? Either my efforts at Budapest have been incorrectly reported, or my intentions have been misinterpreted.

As a British Red Cross delegate I attended the First International Technical Conference on aerial relief at Budapest, at which twenty-five nations and over fifty organisations were represented.

I listened for three whole days to discussions by officials of various countries about what was being done in peace time, and what could be done in war time, in connection with aerial relief.

During practical demonstrations, which formed part of the Conference, Hungarian and French doctors and nurses, and medical and food supplies, were "dropped" by parachute; air ambulances landed and took off with loads of patients, etc. Spectators included an imposing array of naval, military and air force officers of nearly every country in Europe. Everybody was very enthusiastic, and it was agreed that aerial relief had tremendous possibilities.

But, during the Conference, not one single speaker referred to the Geneva Convention of 1929, and in particular, to Article 18 thereof.

It may be recalled that the Convention of 1929 was held to revise the Convention of 1906, and during the course of those discussions the French delegate raised the question of the use of aircraft for medical purposes. After detailed investigation by a special committee, it was obvious that the question was so important that it would be impossible to revise the 1906 Convention without covering the use of aircraft as ambulances and/or for other medical purposes. It was decided to condense the most important principles in a single Article, which we now know as Article 18 of the 1929 Convention.

Clause 1 of that Article states that aircraft used for medical purposes come under the protection of the Convention, and that there is *no need to differentiate between aircraft and other medical mobile units.*

Clause 2 states that the protection is limited to aircraft being used exclusively for medical purposes, but also states that, apart from aircraft bearing the Red Cross emblem, it is not necessary for the machines to be especially equipped for medical transport, the object being to facilitate the conversion of any machine for medical purposes in case of emergency.

It also states that, as in the case of other forms of medical transport, the aircraft may belong to the military authorities, to any voluntary organisation, or to any special organisation formed for the operation of the aircraft.

The said Article 18 also provides for the protection of the aircraft and its personnel in the event of a forced landing in enemy territory. Although the patients may be taken prisoner, the aeroplane and its crew are to be free to return, or will be returned, on condition that they be employed exclusively on medical or Red Cross services until the end of hostilities.

At the Budapest Conference I protested that all the discussion and goodwill was a waste of time unless it could be established that the Geneva Convention would be and could be recognised in war, in relation to the use of aircraft for medical purposes. I referred to Spain and its troubles as an example of what would happen and what has actually happened. The export of air ambulances to Spain has been prohibited on the grounds that all aircraft exports are prohibited and that such air ambulances could be converted for military purposes. So much for the Geneva Convention of 1929 and Article 18. The same thing will happen in the event of an international war. All aircraft will be regarded primarily as aircraft, whether they bear the Geneva Red Cross or not, and, in spite of their being used for medical purposes, will be open to attack, because they could be used for military purposes. Hence my protest, which, incidentally, was very strongly supported by the majority of the delegates at the Conference.

S. J. NOEL-BROWN
Assistant County Secretary (for Air),
Surrey Branch, British Red Cross Society.

PILOTS AND PAY

THE statement which has recently appeared in the Press that the Guild of Air Pilots and Air Navigators of the British Empire is precluded by its constitution from discussing questions of air pilots' salaries is incorrect.

Whilst it is true to say that the Guild has hitherto not concerned itself directly with questions of salaries of airline pilots, it has all along been concerned with conditions of pilots' employment. Nor is it in any way debarred by its constitution from considering such questions, but it definitely eschews trade union methods of dealing with them.

The attitude of the Guild is that it would be very willing to express a considered opinion, or to act as a medium of conciliation on any such question if approached to do so.

LAWRENCE A. WINGFIELD,
Clerk,
Guild of Air Pilots and Air Navigators of the British Empire.

Forthcoming Events

July 4-18. Aero Club of Germany: Wasserkuppe Gliding Meeting.
July 10. Cardiff Aeroplane Club: London-Cardiff Race.
July 10. Lancashire Aero Club: Garden Party.
July 11. Herts and Essex Aeroplane Club: Air Display, Broxbourne.
July 11. Italian Aero Club: Circuit of Rome.
July 15 Aero Golfing Society: Jubilee Cup.
July 17. Portsmouth Aero Club: Garden Party.
July 17-18. Deauville Rally.
July 18. Witney and Oxford Aero Club: Garden Party and Opening of new Witney Aeronautical College Buildings.
July 23-August 1. Swiss International Meeting.
July 24. Devon Air Day and Race: Plymouth and Exeter.
July 30-August 15. "Avia" Aero Exhibition, the Hague.
July 31. Cinque Ports Flying Club: Folkestone Aero Trophy Race.
July 31-August 2. Yorkshire Gliding Club: Opening Meeting, Sutton Bank.
August 1-14. Yorkshire Gliding Club: Instructional Camp, Sutton Bank.
August 3-September 7. Public Schools Aviation Camp Norwich.
August 6-7. Austrian Aero Club: International Rally, Lake Worth.
August 14. Eastbourne Flying Club: At Home.
August 14-22. Yorkshire Gliding Club: Open Contest, Sutton Bank.
August 20. L'Aéro-Club de France: Marseilles—Damascus—Paris Race.
August 21. Thanet Aero Club: Aviation Meeting and Race.
August 21. Midland Aero Club: At Home.
August 22-29. Italian Aero Club: Circuit of Littorio.
August 28 and 29. Cinque Ports Flying Club: Lympne International Rally and Wakefield Trophy Race.
August 28-September 25. B.G.A. National Soaring Competition, Great Hucklow.
September 4 and 5. Southend Flying Club: At Home.
September 10-11. R.Ae.C.: King's Cup Race.
September 12. Aero Club de France: Coupe Deutsch de la Meurthe, Etampes.
September 23. Aero Golfing Society: Cellon Trophy.

"THE BATTLE is in YOUR HANDS"

Flt. Lt. Staniland, in one of the production Fairey Battles, gives a new force to a line from Virgil. This remarkable photograph was secured by *Flight's* chief photographer from an accompanying Swordfish flown by F/O F. H. Dixon.

PRIVATE FLYING

INTERNATIONAL: A scene at the Wasserkuppe on the first day of the International Gliding Competition (see p. 52). In the foreground can be seen Mrs. Ronald Price at the wing tip of her King Kite, while behind is the Hjordis, which is being handled by Messrs. P. A. Wills and J. C. Neilan.

Topics of the Day

Avigation

AS I've said before, the majority of amateur pilots go through the mental agonies of a navigation craze at some time or other, and with some the craze remains for good. Personally, I consider that cross-country flying without a navigational background to one's endeavours is a bore and, at times, a positive danger. And when I say navigation I do not merely mean using a C.D.C. and flying on a compass course checked by landmarks, but working out ground speeds and arrival times at different points on the track, and calculating the actual amount of drift for future reference.

If the weather closes in to the point of blotting out any landmarks except those immediately below one's machine, a knowledge of the ground speed made up to the bad-weather area can be invaluable as well as being a great comfort to the mind. When, say, one *knows* that the town of Exborough is due to be passed at 15.32 hrs. according to previous calculations, one at least knows which little area on the map must be searched for the village which one flew over at the moment when Exborough should, in fact, have appeared beneath the leading edge.

Having discovered the identity of the village one can, if necessary, recalculate one's ground speed and drift so that Wyeborough is then hit spot-on at 16.02 hrs. Nothing is worse than to be dashing about in visibility of less than a mile without having the least idea of one's position or of the position of the nearest aerodrome in case things get worse.

Projections

UNTIL a week or two ago (to confess the abysmal ignorance of a third-class navigator) I could never understand why, on several occasions when flying more than a hundred miles or so "across" the map, I found that I was, at one point, two or three miles away from my track, yet, without alteration to the compass course, I arrived dead over the destination aerodrome.

The reason is simple. Our Ordnance Survey aviation maps are laid out on Cassini's projection, in which a point on a central meridian is selected and the rest of the map, so to speak, built round it. The result is that all the meridians but the central one are curves concave towards the latter, all parallels of latitude are concave towards the Pole, and straight lines drawn on such maps are, over comparatively short distances, virtually Great Circle courses.

Consequently, in order to hold a certain track, the compass course should be altered very slightly from time to time and, the track followed on a constant course being of the rhumb line variety, this track would appear as a curve on Cassini's projection. Hence the off-track effect half-way through a journey. A pilot flying on a constant east-west course never flies over the shortest route, but the difference between a rhumb line and a Great Circle track on a normal cross-country is never worth worrying about. Over the two thousand odd miles of an east-west flight the difference is usually considerable, and the changes in magnetic variation must also be taken into account.

Proportional

FOR the benefit of those to whom the idea of working out a ground speed or an E.T.A. suggests hard work, I may say that the operation requires but one hand and no serious thought. Whilst apologising to the mass of people who know as much as or more about the job than I do, it must be said that I have met an extraordinary number of amateur pilots who have not the least idea of the meaning of the series of numbers to be found on the perimeter of a C.D.C.

After suitable apology I may explain that these figures form a proportional calculator, or simple circular slide rule. If, for instance, your ground speed being 108 m.p.h., you place the figure 60 (minutes) on the inner scale against 108 on the outer scale, you can then read off any number of miles against any number of minutes. If, on the other hand, you have taken 20 minutes to travel 40 miles, then you have only to place these figures together to read off your actual ground speed against the 60 mark.

All of which is very simple stuff, but, as I've said, quite a few pilots look on it all as highly mathematical tripos. There are lots of other uses for this proportional calculator, one of which is that of working out allowance for height on the air speed indications. If you place 60 on the inner scale against your indicated air speed on the outer scale, then the outer scale reading against each division beyond 60 is your actual air speed for every thousand feet. For instance, you are flying at 6,000ft., and your A.S.I. reading is 102 m.p.h.; you place 60 (inner scale) against 102 and read off 112 against 66. 112 m.p.h. is your actual air speed.

You can use the device for calculating the distance which, in terms of gallons, is left in your tanks; for discovering the number of Reichmarks you will obtain for a certain number of pounds sterling; and, in fact, for working out any sums involving straightforward multiplication and division—which, after all, are only proportional problems.

The point I want to make is that this business of serious navigation is far from being hard work, and adds a great deal to the fun of flying from place to place.

INDICATOR.

FROM the CLUBS and SCHOOLS

LONDON

IN spite of the fact of three non-flying days caused by the Hendon Display and the S.B.A.C. Show, the Club carried out 90 hr. 25 min. flying last week. First solo flights were made by Messrs. J. De Havilland, C. R. A. Grant, P. A. Hudson, and C. B. Anderson.

REDHILL

The Volunteer Reserve School started work on July 3. Machines of the Redhill Club spent over 101 hours in the air during the week ended July 2, while for the month of June nearly 360 hours were recorded.

HULL

The total flying time for June was 119 hours, of which 49 hours were spent in instruction. The Club Swallow recently assisted in an anti-gas drill demonstration given by the St. John's Ambulance Brigade at Scarborough.

SOUTHEND

In spite of the fact that five machines attacked Brookland's Evening Patrol, they were unsuccessful. First solo flights were made by Messrs. Richard Cross and E. Sarll, the latter also completing his "A" licence tests.

BRISTOL AND WESSEX

Flying times for the month ended July 2 amounted to 171 hr. 95 min. First solos were made by Messrs. N. A. Clark and W. C. Marsh, the former and Mr. A. V. Kilburn also completing their "A" licence tests. There are ten new members.

CAMBRIDGE

Flying times at Marshall's School for the week ended July 4 totalled 80 hr. 20 min. Cross-countries were flown to Yorkshire, Wolverhampton, and Norwich. The Monospar flew to Doncaster and Cannes and the Puss Moth was flown to Bristol.

SOUTH COAST

With the exception of Saturday, the weather was not too good at Shoreham, and only 39 hours' flying was carried out. All the Club machines went to Brooklands on Sunday to assist in defending on the first Supper Patrol. Weather permitting, a picnic party to Haldon is being arranged for Wednesday and all machines will be going to Bekesbourne on Sunday for their Dawn Patrol.

HANWORTH

During the week ended July 3 several cross-country flights were carried out by the London Air Park Flying Club, including one as far as Exeter. With Mr. Carey's assistance on instruction, the total flying times amounted to 120 hr. 25 min. First solo flights have been made by Messrs. C. A. V. Smith, H. Rees, Willis and A. Allan. A party of senior boys from St. Paul's School visited the Club on Saturday, July 2, when they were given their first air experience.

YORK AND LEEMING

Mr. F. W. Barretto has been appointed instructor and manager of Leeming aerodrome and Mr. Bridges has joined the staff at York as a charter pilot. Notable visitors to the aerodrome were Prince and Princess Bibesco in a Potez 561. During the week ended July 3 taxi trips were carried out to Oxford and Bircham Newton. The total flying time for June amounted to 316 hr. 25 min.

YAPTON

A record flying total for June was reached by the Yapton Aero Club, which put in 212 hr. 15 min. during the month. Mr. Swift Coleman flew the first cross-country solo for his "B" licence and has passed the technical examinations, whilst successful candidates for "A" tests were Messrs. J. D. Walsh and C. Parish. A first solo was made by Miss E. Curtis.

BROOKLANDS

The Theatrical Garden Party was held at the aerodrome on Sunday, June 27, with Mr. Arthur Woods of Warner Bros. as host. Among those present were Claude Hulbert and Enid Trevor, Mr. Reginald Gibbs, Bebe Daniels, Ben Lyon, Sonny, Binnie and Robert Hale, and Laura la Plant, together with many other theatrical celebrities. A first solo was made by Mr. Hopkins, and the Club flying times totalled 130 hours.

YORKSHIRE

Dr. and Mrs. A. A. D. La Touche left Yeadon on July 2 in their Moth for the South of France, and Messrs. W. Adams and A. G. Wilson departed on the same day for Belgium. A new-comer is Mr. E. H. L. Sexton, who has joined as a temporary flying member. Many cross-country flights have been made, some as far afield as Heston, Carlisle and Manchester, bringing the flying time for the week ended July 2 up to 85 hours.

C.A.S.C.

On Sunday, July 4, the London and Cambridge Squadrons held their second open day at Fen Ditton aerodrome, flying times totalling 20 hr. 15 min. The various competitions attracted a considerable crowd of spectators and the following members were successful:—Cross country competition, P. W. Roberson (No. 3 Cambridge Squadron); landing competition, J. G. Arrow (No. 2 London Squadron); bombing competition, W. G. Smith (No. 1 London Squadron).

CINQUE PORTS

Several members took machines to the Le Zoute party last week-end, producing a total of over 80 hours' flying. Another new Cirrus Minor Swallow has been added to the Club fleet and is being suitably admired. An "A" licence was obtained last week by Mr. R. C. Cockburn, while Capt. Lethbridge made his first solo. The Club records with great sorrow the death of Mr. H. C. Brewer, who was killed in a recent train accident at Swanley. Mr. Brewer, who was with the Fairey Aviation Co., was one of the Club's oldest flying members.

Cubbing at Leicester

THE TAYLOR CUB (genus Americana) which the County Flying Club, Leicester, has just acquired, put in fourteen hours' flying in its first week-end. Every evening, weather permitting, the machine is fully booked up and the club's instructors, F/O E. C. Headley and Mr. S. Dodwell, seem to be in for a busy time. The Drone, with its accompanying preliminary and ground trainers are, of course, still going strong.

Flying has started at the club's new aerodrome at Rearsby, a couple of miles from Ratcliffe aerodrome.

R.Ae.C. Official Notices

RALLY at Orly.—The Aero Club de France is organising an air rally at Orly, near Paris, on August 1, in connection with the Paris Exhibition. Prizes amounting to 200,000 francs in cash are offered in the various classes.

Free hotel accommodation will be given for a period of three days, and certain social functions will be arranged. The entry fee is 100 francs, and full particulars and entry forms can be obtained on application to the Royal Aero Club, 119, Piccadilly, London, W.1.

Aero Golfing Society.—The Summer Meeting of the Aero Golfing Society for the trophy presented by the proprietors of *Flight* was held at Swinley Forest on July 1.

P. Q. Reiss, 75 – 5 = 70, was the winner, the runners-up being Major A. Goodfellow, 90 – 16 = 74, and E. Fulford, 82 – 8 = 74.

The winners of the four-ball foursome against bogey, G. F. Roberts and P. Q. Reiss, returned 7 up.

Supper Patrol

AFTER an almost perfect Saturday, with a ceiling at the limit, Sunday was heavily overcast with a cloud base varying between 800 and 1,500ft. or so. There was rain and drizzle, too, over certain areas in the Midlands and south of England.

Nevertheless, thirty-two machines raided Booklands Supper Patrol, which was held after the Theatrical Garden Party, duly recorded in the club news. The fact that machines had to attack between 1,000ft. and the ceiling must have made it easy for the defenders and only four machines managed to get through to a free supper for their crews. In any case, the defenders had fewer machines with which to deal. Good weather should have produced a record entry; everyone likes the idea of a Dawn Patrol, but not so many care to get up early, and some cannot even get hold of an aeroplane. The raiders in this case came from the London, Insurance, Herts and Essex, South Coast, Northampton, Leicester, Reading, Portsmouth, Redhill, Heston and Hanworth clubs. Not so bad at that.

The Renfrew Accident

WE regret to record the deaths of Capt. John Houston, the chief instructor of the Scottish Flying Club, and Mr. M. O'B. S. Barrington, sales manager of the Percival Aircraft Company, who were killed, with two well-known members of the Scottish club, in an accident at Johnstone, Renfrewshire. The machine, a Vega Gull, apparently stalled-in off a gliding turn near the ground.

Capt. Houston, the son of Mr. George Houston, the Scottish artist, had been chief instructor of the Scottish Club for the past seven years, and was previously with the Beardmore School of Flying at Renfrew.

Mr. Barrington was educated in South America, Switzerland and at Magdalene College, Cambridge, where he obtained a B.A. with honours, before studying at the D.H. Technical School. This he left in 1933 to join the D.H. sales department. He had been with the Percival Company for the past few months, and was the holder of a pilot's "B" and G.E.'s "A" and "C" licences.

GONE ABROAD

The Preliminaries of the International Soaring Competitions at the Wasserkuppe

AT Hamburg docks on June 28, the five British sailplanes entered for the International Soaring Competitions in Germany were unshipped. After causing several traffic blocks in the city, the long procession of five cars with their five trailers escaped into open country—and so, after a two days' journey, reached the Wasserkuppe, the highest point of the Rhön Mountains in Central Germany.

Here, fifteen years ago, the world's first prolonged soaring flights were made over what was, at that time, practically a bare mountainside. Now, the first British team to attend an international soaring contest found a great built-up area devoted entirely to the requirements of gliding men, all at the disposal of the various national teams, whose members are to be the guests of the Aero Club of Germany throughout the meeting. Everywhere the greatest kindness is met. Free petrol and oil are at the disposal of each team for retrieving their machines from cross-country flights; a German acquainted with the district is attached to each retrieving party; unlimited handling crews are at everyone's disposal; and all workshop facilities, with expert assistance if required, have been made available for any repair work needed.

Professor D. Brunt, leader of the team, arrived on July 1 with those who had not already come with the sailplanes, and the British party of some two dozen persons was then complete. All that day the summit of the Wasserkuppe was in cloud, but, fortunately, two days of clear weather, with active cumulus and plenty of thermal lift, remained for the pilots to get accustomed to the site before the actual start of the competitions on July 4. Major J. E. D. Shaw had sent out his Avro Cadet, fitted with towing apparatus, from Kirbymoorside with Mr. McMurdo, so all pilots were towed up from the aerodrome to the region of cloud lift.

The British entries are: Hjordis: Pilots P. A. Wills and J. C. Neilan. King Kite: J. C. Neilan and Flt. Lt. P. M. Watt. King Kite: P. M. Watt and G. O. Smith. King Kite: D. G. O. Hiscox and Mrs. Ronald Price; and Falcon III: Flt. Lt. W. B. Murray and J. S. Fox.

The Falcon III is a two-seater sailplane, but will probably be flown solo in light winds to get the best performance, and with two up for long duration flights only. The other machines are single-seaters, the Hjordis being two years old, and the King Kites almost new and, as yet, little tried by their pilots.

The chief prize of RM. 2,500 will be awarded on points, which can be earned in the categories of distance, height, duration and out-and-return flights round a specified triangular course of about twenty-two miles. Other prizes are for longest distance, greatest height, and greatest aggregate duration. Of the British machines, the Hjordis is expected to try specially for height, and the King Kites, with their great speed range, for distance, while the two-seater Falcon will concentrate on duration. There are also daily prizes, and six prizes offered by the German Chancellor and others. Besides the British entries, Germany and Poland have each entered five machines, Czechoslovakia and Switzerland four each, and Austria three. Two Jugoslavian sailplanes are expected later.

The first day of the competitions started with a light and hardly soarable wind up the south slope, but by the time the opening ceremony, performed by Wolfgang von Gronau, was over, thermal currents had set in and launches began. Of the five British machines only one, the Hjordis, got away across country, the pilot, P. A. Wills, landing 85 km. away at Langensalza. Two King Kites and the Falcon III found patches of thermal lift but had finally to land in the valley below, while the third King Kite, flown by P. M. Watt, had the misfortune to stall while the pilot was circling in a thermal current just after his launch; the machine spun into the ground from about 150 feet, the pilot having insufficient height to recover. He was fortunately uninjured, but the machine has been too far damaged for further participation in the meeting.

GEODETIC PERFORMANCE

ALTHOUGH it is not yet permissible to give a complete structural description of the Vickers Wellesley monoplane some data have lately been released which not only indicate the value of the Vickers-Wallis system of "geodetic" construction employed, but reveal the aerodynamic efficiency of the machine.

All performance figures given hereafter were obtained during test flights at Weybridge, and apply to the machine as fitted with the Bristol Pegasus PE-5.S.M.(a) engine delivering 900 h.p. (max.) at 15,000ft.

The Wellesley is classed by the manufacturers as a long-range bomber, torpedo carrier or general-purpose machine.

A fixed gun for the pilot is mounted in one wing and there is a second weapon on a special mounting in the rear cockpit. Bombs are carried in external streamlined containers below the wings.

The undercarriage retracts hydraulically and uses low-pressure wheels. A swivelling tail wheel is incorporated.

Frise ailerons, split trailing edge flaps and trimming "tabs" on the elevator and rudder are specified. The service equipment includes wiring and brackets for R.A.E. navigation lights and bonding for navigation lights.

Wellesleys, with Pegasus XX engines, already form the equipment of No. 76 (B.) Squadron at Fenningley, near Doncaster.

Span		74 ft. 4 in.
Length		39 ft. 3 in.
Height		12 ft. 4 in.
Wing area		630 sq. ft.
Petrol capacity		425 gal.
Oil capacity (main)		12½ gal.
" " (auxiliary)		7½ gal.
	Normal Load.	Overload.
Weight, bare, with instruments	6,233 lb.	6,235 lb.
All-up weight	10,900 lb.	10,500 lb.
Wing loading	17.3 lb./sq. ft.	19.8 lb./sq. ft.
Power loading	12.1 lb./h.p.	13.8 lb./h.p.
Range	1,325 miles at 187 m.p.h.	2,270 miles at 186 m.p.h.
Height. ft.	Speed. m.p.h.	Time of Climb. min.
Sea level	191	—
3,280	191	3.6
6,560	198.5	7.1
9,840	208	10.6
13,120	217	13.9
16,400	226.5	17.0
17,000	228	17.9
19,680	226.5	21.5
Initial rate of climb		1,090 ft./min
Landing speed (with flaps)		54.5 m.p.h.
Take-off run		306 yd.

Hatfield—Lisbon in 5½ Hours

THE D.H. Comet *Black Magic* first achieved fame in the hands of Mr. and Mrs. Mollison in 1934, when it was flown from Mildenhall to Baghdad, a distance of 2,530 miles in 12 hr. 40 min.

Recently it was at Hatfield for repairs following a mishap in Portugal, to whose Government it now belongs, and it was decided that Lieut. Carlos Costa Macedo, Chief Instructor of the Portuguese National Flying School, who was in England in connection with an order for three D.H. Dragons, should fly the Comet back to Portugal.

At 12.12 p.m. last Friday, July 2, he took off from Hatfield in rain, flying into a south-west wind under low clouds and heading almost due south for Brighton. From Brighton, where weather reports improved, he made for Le Havre, then to Biarritz and across Spain to Lisbon. The whole distance, approximately 1,100 miles non-stop, was covered in 5 hr. 27 min., an average speed of 200 m.p.h.

The Comet, which has two Gipsy Six R engines, has tankage for 257 gallons of fuel, but on this occasion only 170 gallons were taken on board, this being sufficient for seven hours in the air.

Lieut. Macedo, who carried no radio equipment, made a similar flight in this Comet with Carlos Bleck—De Havilland's Portuguese representative—as passenger on February 25, 1935, when he completed the non-stop London-Lisbon journey in 6 hr. 5 min.

HEIGHT RECORD HOME AGAIN

Bristol 138 (Pegasus Special), Flown by Flt. Lt. M. J. Adam, Reaches 53,937 ft.

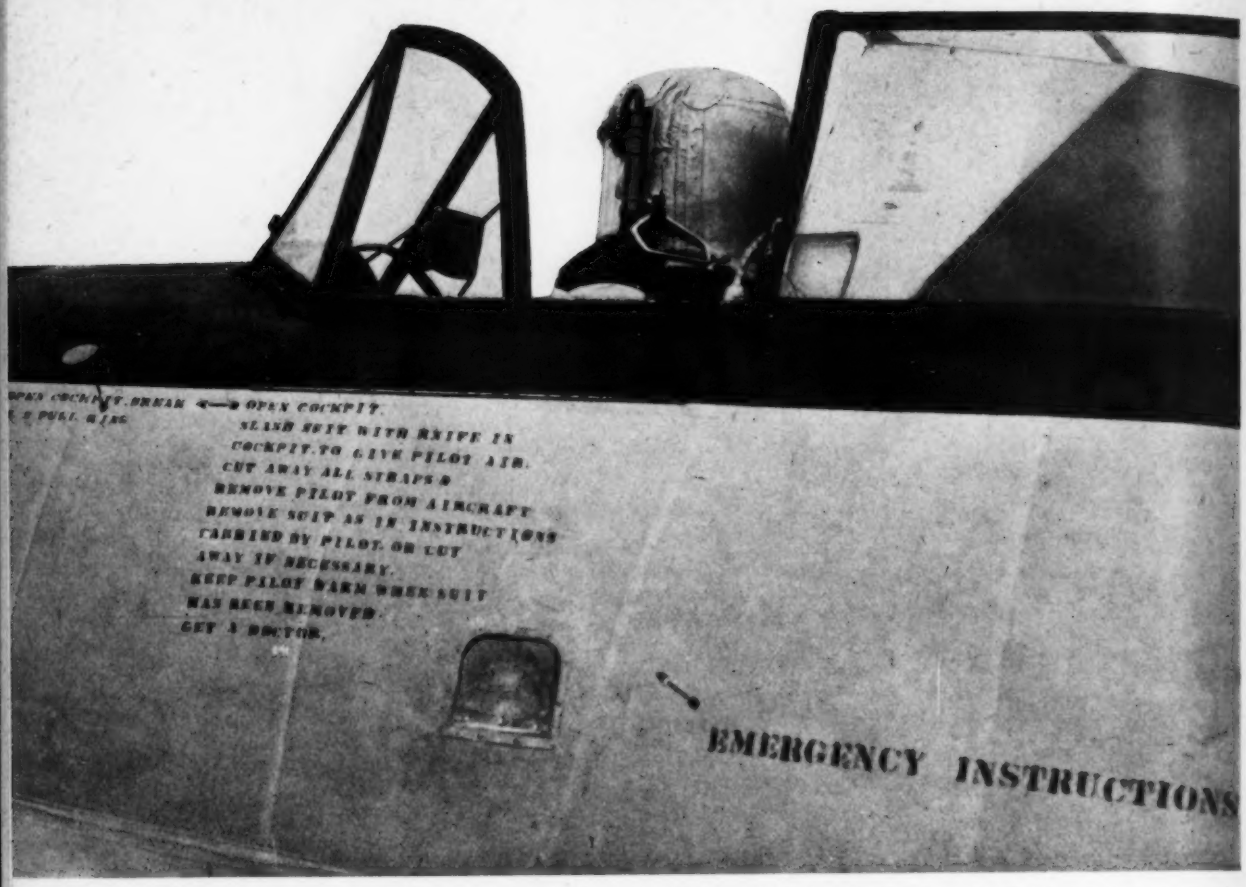
TO top the mélange of Britain's recent demonstrations of aeronautical eminence, Flt. Lt. M. J. Adam, a pilot of the Royal Aircraft Establishment, Farnborough, has broken the world's altitude record, previously held by the Italian, Lieutenant-Colonel Mario Pezzi with 51,362 ft., by taking the Bristol 138 monoplane to 53,937 ft. (16,440 m.). Our margin is thus 2,575 ft.

This is the second successful attempt by the R.A.F. to capture the record, and crowns a period of intensive preparatory flying by Flt. Lt. Adam.

The aircraft was the machine in which Sqn. Ldr. F. R. D. Swain gained the previous British record of 49,944 ft. last autumn. A few minor modifications have been made since that time, including the fitting of smaller wheels and the deletion of the brakes.

Flt. Lt. Adam wore the same pattern of pressure suit as that used by Sqn. Ldr. Swain, but this, too, was improved in detail with a view to eliminating the frosting of the visor portion. He was in the air for two and a quarter hours, his performance being all the more meritorious because of the prevailing weather conditions. In the upper regions Flt. Lt. Adam encountered a fierce westerly gale, and unbroken cloud formations blotted out his view of the earth for long periods.

The triumphant Bristol 138 monoplane is stationed at the R.A.E., Farnborough, where it is seen flying above. On the left, Flt. Lt. Adam is insinuating himself into the pressure suit, and in the third view is seen discussing chances with Wing Cdr. J. W. Woodhouse. (*Flight* photographs.)



One of the least encouraging factors to Flt. Lt. Adam must have been his glimpse, on entering the cockpit, of the emergency instructions inscribed on the fuselage of the Bristol. (*Flight* photograph.)

Relying on his weather report and his own estimates of wind speed and direction, he set a course that would keep him within the coasts. Apparently the record height was attained somewhere between Bristol and Oxford. The ascent, which occupied just over an hour and a half, was made on a course which touched Winchester, the North-eastern fringe of London, and Dorking.

The take-off from Farnborough was at 5.40 a.m. on Wednesday, June 30, and the Bristol was headed south-west. Just west of Winchester, Flt. Lt. Adam met a cloud bank which stretched unbroken from Spithead far into the north-east at 7,000 ft. This forced him east, but, blinded by the sun, he turned again to the north-east. At 20,000 ft. he was over Staines, with the cloud base forming rapidly about 5,000 ft. above. By the time the Bristol had climbed 35,000 ft. there were few gaps in the two cloud layers beneath, the last town recognised by the pilot being Rochester, glimpsed from somewhere north-east of the Metropolis.

Auxiliary Boost

After engaging the second supercharger at 35,000 ft., Flt. Lt. Adam lost sight of the earth completely until he was down to 15,000 ft. on the descent.

For thirty minutes, up to 50,000 ft., the machine was headed into a north-westerly gale, and after another half-hour's climb it appeared to have reached its ceiling. At this point the altimeter registered 55,000 ft., and the outside temperature was minus 48.9 deg. C. Near the ceiling the transparent cockpit cover split, owing to contraction with the cold.

From his first glimpse of the ground on the descent Flt. Lt. Adam formed the impression that he was somewhere near Bristol. Altering his course to the north-east, he glimpsed a river through a gap in the clouds, which he guessed was the Isis, near Oxford. A few minutes later he sighted the reservoirs near Staines, and at 7.55 he set the Bristol down at Farnborough.

The attempt was observed by an official representative of the Royal Aero Club, and the height attained has been officially communicated to the Ministry by the Club; it was arrived at from an examination by the National Physical Laboratory of the sealed barothermographs which were carried in the wings of the machine. The figures are subject to the usual confirmation and acceptance by the Fédération Aéronautique Internationale, to which application for homologation will be made in due course.

Flt. Lt. Adam, who was chosen to succeed Squadron Leader Swain on high altitude duties, was born at St. Andrews in November, 1908. He was educated at the Madras College, St. Andrews, and George Heriot's School, Edinburgh, later being a student at the Episcopal Theological College, Edinburgh, and the Edinburgh Tutorial College.

Entering the Royal Air Force as a short-service commissioned officer for piloting duties in August, 1929, his initial period of service has since been extended by the grant of a medium-service commission.

Flt. Lt. Adam qualified as a pilot at No. 1 Flying Training School, Netheravon, in the summer of 1930, and after a short term with No. 24 (Communications) Squadron, Hendon, he proceeded to India, where he served on the N.W. Frontier with No. 11 (Bomber) Squadron, at Karachi with the Aircraft Depot, and later with No. 60 (Bomber) Squadron. He took part in various air operations in 1930 and 1931, and again in the spring and autumn of last year. He returned to England towards the end of 1935 and joined the strength of the Royal Aircraft Establishment in February of last year.

Details of the Bristol 138 monoplane were given in *Flight* of October 1, 1936, at the time of Sqn. Ldr. Swain's success. It is a low-wing cantilever monoplane with a fixed undercarriage and a special engine of the Pegasus series with a two-stage supercharger.

The following items were among those which contributed towards the success of the venture: Shell fuel, K.L.G. plugs, Claudel Hobson carburettor, Saro plywood, Smith's instruments, Reid and Sigrist turn indicator and fore-and-aft level, and Dunlop tyres.

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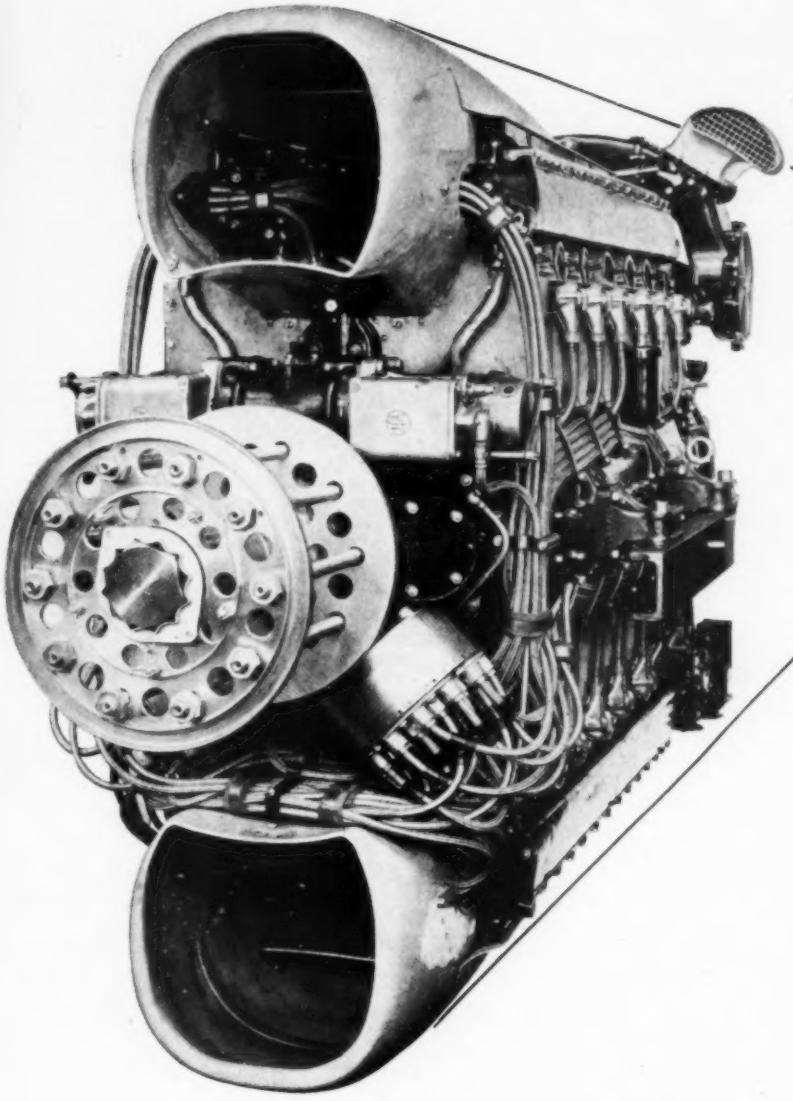

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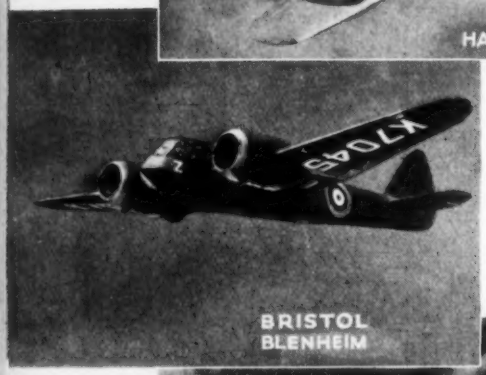

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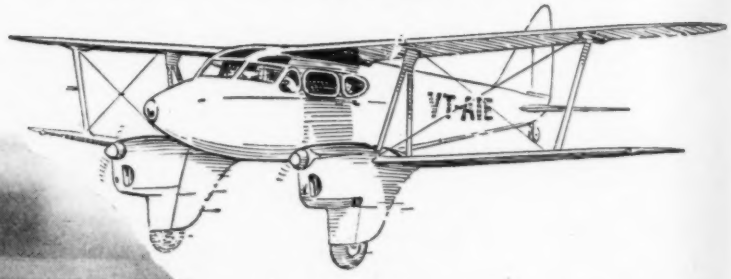

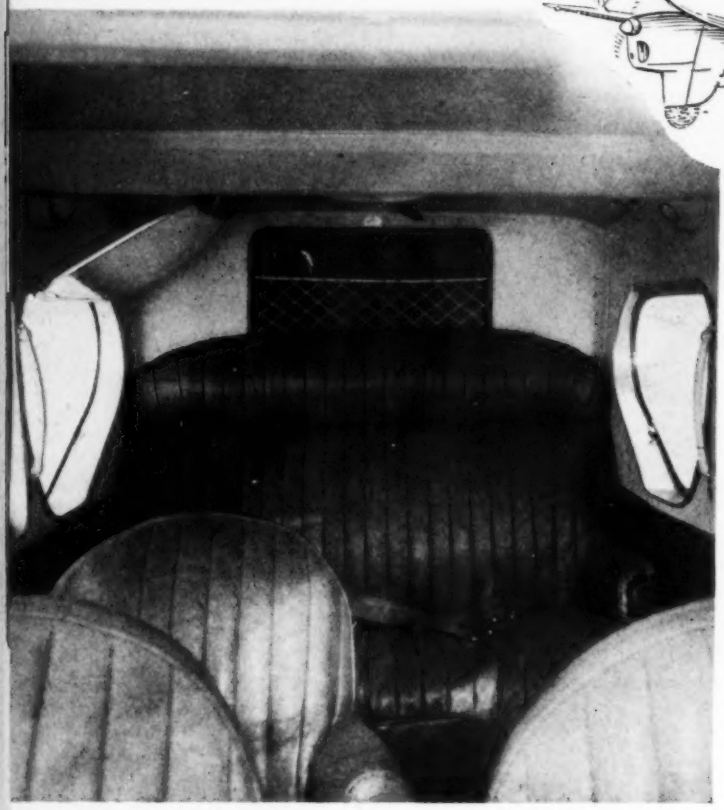

A Dragonfly interior as provided for H.H. The Maharaja of Indore

He wants an aircraft with accommodation rather like that of a big car—a quiet comfortable saloon for four or five people with the luggage separately stowed. He wants to fly the machine himself but to have his professional pilot beside him so that they can share the control and discuss the navigation like the crew of an air liner.

He wants an aeroplane of clean lines and up-to-date flying characteristics, good take-off, stability, steep approach, not too critical at the landing, and with a good view, and of course a fair turn of speed.

He wants the double security of two good engines, engines that he trusts, engines that everybody trusts, engines that are known and serviced everywhere without fuss and delay. The aircraft, too, must have the knowledge of long and world-wide operating experience built into it by the makers—that is the only way to be sure of trouble-free travel and moderate maintenance cost.

He realises that he wants rather a lot, an air liner without the cost of an air liner, an air liner in miniature—

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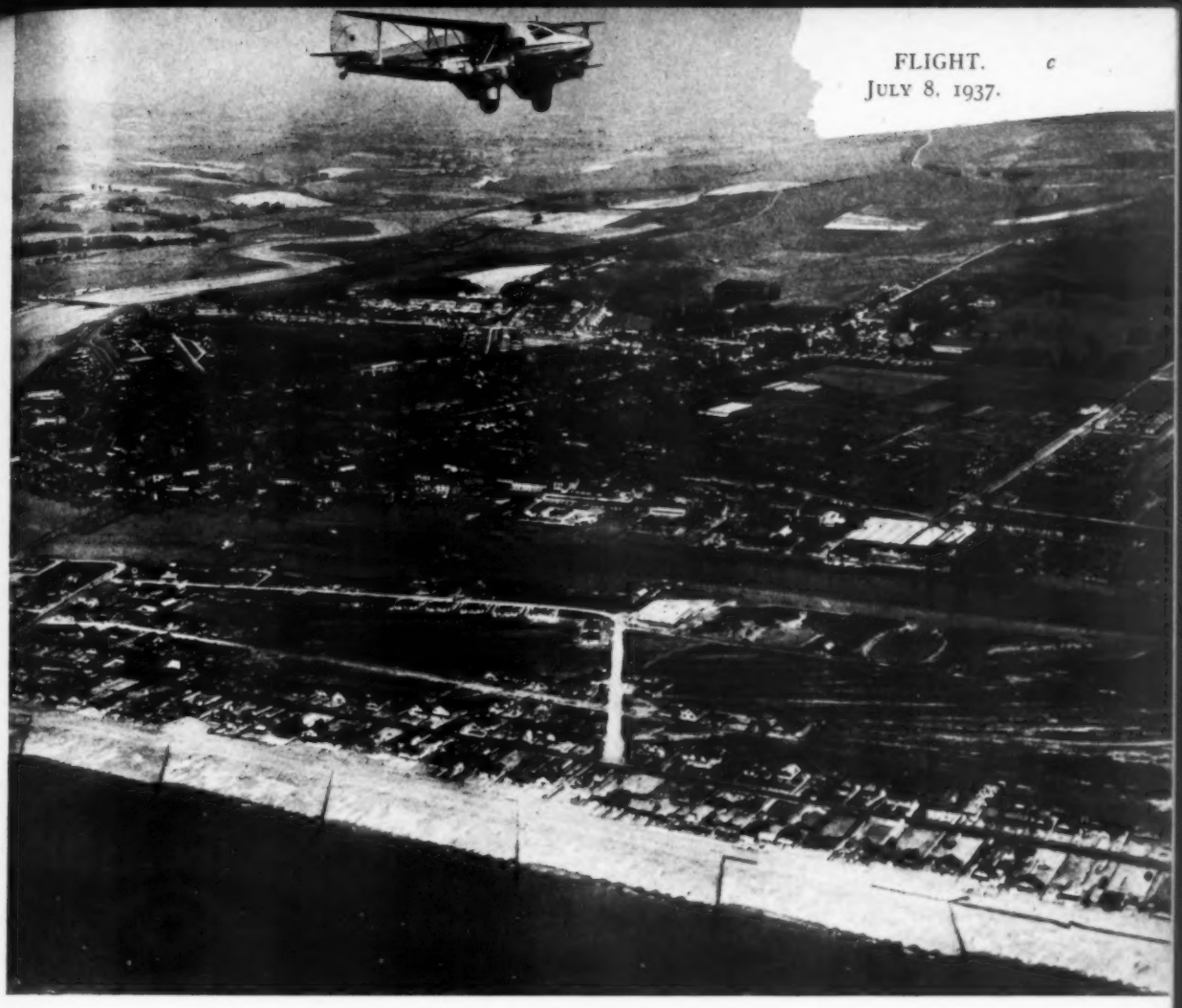


It is seldom that the aerial photographer is fortunate enough to enjoy atmospheric conditions that will allow such perfection of detail as is seen above. Shoreham, Sussex, is the ground subject, and the machine is a Jersey Airways D.H. 86.

OBLIQUE AERIAL PHOTOGRAPHY

Some Practical Hints for the Beginner and his Pilot.

By G. W. MILLER
(Photographic Instructor, Air Service Training, Ltd.)

PHOTOGRAPHY from the air has become a recognised profession. The pictures obtained are used for a variety of purposes—for instance, for the recording of scenes encountered in an air trip, for the illustration of news stories, for commercial purposes (factories, housing estates, etc.), and for the study of archæological excavations.

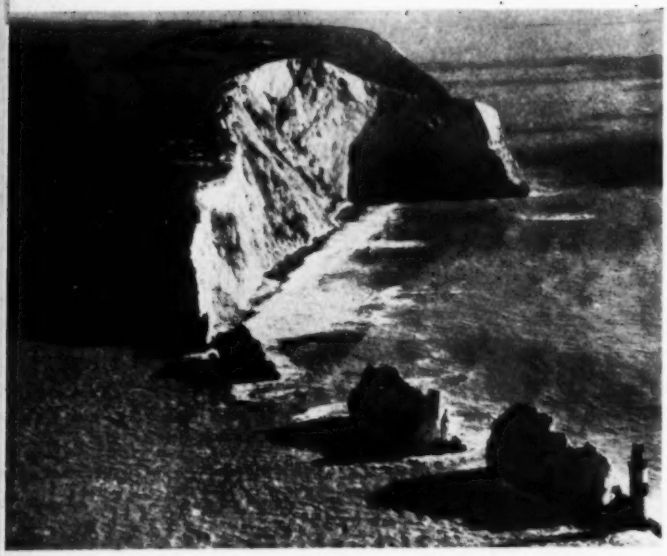
Such pictures possess a striking appeal when the composition of the view is correctly rendered. Proficiency is obtained by experience, in conjunction with the use of an air camera designed for the purpose.

To those who are unfamiliar with the taking of air pictures, the term "oblique" conveys the angle of the photograph from the aircraft in flight. The most favourable angle lies between 30 deg. to 35 deg., and will result in rendering truly the perspective of the subject—though success, of course, is also dependent on the altitude of the aircraft and the nearness of the camera to the subject.

By way of illustration, a view is wanted of a factory which possesses several tall chimneys. Should the operator be in such a position that the aircraft is too directly above and too near the subject, the resulting picture will have the appearance of falling towards the viewer. No definite altitude can be laid down for oblique photography, because it will vary according to the area requirements of the picture. But for normal purposes a height of between 500 and 1,000 feet will be most suitable and convenient.

The type of lens, particularly as regards focal length, has a distinct bearing on the height at which it will be necessary to fly. Supposing a view is wanted of a golf course or a large housing estate. Fitted to the camera is a lens of 6in. focal length. This type of lens reproduces on the plate or film a very large amount of ground, due to the wide angle existing between the plate or film and the axis of the lens. On the same-sized plate or film a longer focal length has the effect of decreasing the area covered. Obviously, if it is desired to use a 10in. lens it will be necessary to fly higher in order to cover the area obtainable with the 6in. lens.

There are two classes of aircraft hand cameras commonly used—the roll-film type, the magazine of which carries sufficient film for 125 photographs at one charge. The other type is the plate camera, which carries no magazine, only an adaptor whereby one plate is exposed from individual slides. It will be seen that a great saving in weight is achieved by the use of film, and it possesses another great advantage over the plate insomuch that a



Three photographs taken by the author to illustrate his points. Top to bottom : St. Catherine's Hill, Winchester—an archæological subject ; Netley Castle, Hampshire, and the ruins of Netley Abbey—a typical general subject ; and The Needles, Isle of Wight, showing how intelligent placing with regard to light helps to throw the subject into relief.

plate is liable to be broken, though it is true that films can be scratched by careless handling.

All air camera lenses are of the anastigmat type, which simply means that the lens has been specially selected and scientifically ground for the purpose, and will render a sharp, undistorted image on every point of the plate. Incorporated in the lens combination is a light filter, made of gelatine, generally yellow in appearance, which serves the purpose of overcoming to a considerable extent the effect of the haze or mist which is generally present.

Panchromatic plates or film, being sensitive to all colours, are used for air work to obtain a balance of graduated tone in the resultant negative.

Sighting Arrangements

Hand grips are attached to the body of the camera for maintaining a firm and comfortable grip, which is essential at the moment of exposure. The sighting arrangements consist of (*a*) a pair of metal frame sights with cross wire sections, fitted front and rear on the lens cone, or (*b*) the tubular sight, which consists of a metal tube fitted with cross-sectional wires inserted at either end, or (*c*) a miniature lens mounted in a metal frame which is used in co-operation with an upright bar—the rear sight—fitted centrally.

Most aerial cameras have adjustable slits in the aperture of the shutter blind and variable tensions to assist in securing the maximum amount of light necessary for the exposure without showing the effect of aircraft motion. Several kinds of shutters have been evolved, but the focal plane self-capping type is the one mostly used for air work. Generally speaking, a speed of 1/100th sec. is the slowest at which a shutter can operate with success.

Team work between the pilot and camera operator is essential, and a thorough understanding of the methods to be adopted must exist, before leaving the ground, to avoid waste of time, especially through too much talking whilst flying. Having determined the altitude at which to operate, the pilot should fly the aircraft into wind so as to diminish speed, or, if this is inconvenient for the composition of the picture, a course across wind should be taken.

The Approach

It is obvious that the more slowly the machine proceeds, the simpler will be the work of the camera operator, whose job it is to hold the view through the sights perfectly stationary during the exposure, otherwise movement will cause displacement of the objective. The light conditions must be studied and used to the best advantage; a photograph taken "across" the light will give the effect of relief through the agency of shadows cast. Just prior to approaching the subject the aircraft is throttled down and placed in a steady glide within the margin of safety; meanwhile the camera operator should be ready for taking the picture (i.e., the shutter should be wound, and plate or film ready for the picture) and occasionally glancing through the camera sights to see if the position is suitable. The pilot, of course, also watches the object and manœuvres his machine to the best advantage. In the event of the machine being too near or far away, he executes a gentle turn in or out as the situation demands.

Assuming that the positioning is correct, the camera is firmly held to withstand (in the case of an open machine) the slipstream, and brought up into position, taking an aim three-quarters to the rear of the trailing edge of the main plane, where the subject is "moving" more slowly than at the position directly broadside. When the objective is poised in the centre of the two harmonised sights, a slow, steady pressure is applied to the trigger. At the moment of exposure the breathing is restrained, and the camera and arms of the operator must be clear of the fuselage, otherwise vibration will be set up, and the photograph will be ruined.

If all the points mentioned are observed, an excellent oblique photograph should be obtained, though, as with most things, luck often plays a part.

RAIN at the PICNIC

But British Pilots Enjoy Hungary's "Annual" as Much as Ever

OF the record entry of seventeen aeroplanes for the fourth Magyar Pilota Picnic organised by the Magyar Touring Club and the Automobile Association, only one failed to materialise, and of the sixteen arrivals in Hungary all except two checked in on the opening day. This promptitude was doubtless due in some part to the arrival competition which had been arranged by the Magyar Touring Club to celebrate its birthday. Those pilots who landed at the aerodrome at Szekesfehervar—near Lake Balaton—on June 15 between the hours of 10.00 and 14.00 were eligible for the competition, which was decided by a draw to select the sealed time. Much to everybody's pleasure, the eventual winners were announced to be Mrs. Morris Davies and Mrs. Macdonald, who, between them, had flown a B.A. Swallow to the Picnic.

Another trophy awaited the pilot of the aircraft adjudged to be the most suitable for touring, and after due deliberation by a committee of experts this trophy was awarded to Mr. M. L. Bramson, who was piloting a Percival Vega Gull.

The first day (writes a British participant) was spent at Siófok on Lake Balaton, Hungary's substitute for the sea. In many ways the Hungarians are to be envied. The Lake, which is the largest in Europe, is very shallow and in summer is warm enough to encourage the most timid of bathers. (Incidentally, with commendable adaptability, it provides an ideal arena for skating and ice-yachting in winter.) Unfortunately, after some six weeks of uninterrupted sunshine the weather broke on the opening day of the Picnic and the aquatic sports were necessarily somewhat curtailed.

Boreas and Bacchus

The programme on the Wednesday took the party across the lake by steamer to Balatonfüred, where, after lunch, the local wine cellars were visited and sampled. The return journey was made in a gale which whipped up large waves on the lake, and this fact, coupled with the after-effects of the wine cellars, made many well-known pilots look thoughtful and somewhat pale.

The next morning, owing to the high wind it was judged prudent to abandon the visit to Mezohegyes, the agricultural centre of Hungary. Instead, lunch was taken at Siófok, after which, the wind having abated, the party flew to Debrecen in Eastern Hungary for the night, according to programme. A sumptuous dinner at the Forest Redoubt Restaurant finished off the day—or started the next, according to individual taste.

Friday morning started early with the triumphant playing of a brass band outside the hotel at 05.00 hrs. This was followed by a march-past of what must have been a very considerable portion of the Hungarian army, in which cavalry and mechanised artillery were well represented. It was later learned that this exceedingly smart parade was in celebration of the Regent's birthday. After breakfast a leisurely start was made for Hortobágy, a spot in the middle of the Hungarian plain and not at all easy to find. Before and after lunch, at a quaint local inn, we were entertained by cowboys who treated large and dangerous-looking herds of cattle with enviable contempt. The casualties were among the British guests, who, in trying to crack fifteen-foot whips, managed only to slash themselves.

In the late afternoon the party left for Budapest, landing at the old aerodrome at Matyasfold. On the way into the town the opportunity was taken to lay a wreath on the Unknown Warrior's Tomb, the ceremony being performed by one of the British pilots on behalf of the visitors. Of the two days in Budapest little can be written except to say that they were largely occupied with bathing, eating and drinking.

On Sunday afternoon the participants in the Picnic were invited to attend the ceremonial opening of the new airport for Budapest, situated on the other side of the town from Matyasfold. It was arranged that the visiting machines should fly over from the old to the new airport in line-ahead formation (widely spaced!), arriving at 16.30 hrs. and forming the first item in the official programme. It was most unfortunate that it rained on and off during the display. Such weather is apparently unheard of in Budapest in June, but the whole of the programme was carried through without interruption.

The first item on the programme after the arrival of the British guests was a pretty display of flying by two gliders towed by air from Matyasfold Aerodrome, and this was followed by a demonstration of formation flying by a squadron of German fighters. These aircraft, which were said to be of Heinkel manufacture, are low-wing monoplanes with retractable undercarriages, and engines approximating to 900 h.p. In general design they appear similar to our own monoplane fighters, if perhaps somewhat larger. The pilots were said to have only just received their aircraft, and they confined themselves to high-speed dives and turns in separate flights.

Next followed a demonstration of formation flying by a squadron of the Austrian Air Force mounted on Fiat biplanes. As the Austrian Air Force was something of an unknown quantity this demonstration was watched with great interest, and it must be admitted that the standard of formation flying and general ability of the pilots reached a very high level.

The most impressive display of the afternoon was given by a squadron of the Italian Air Force similarly mounted on Fiat biplanes. This squadron consisted of ten machines, which for most of the time was split into two flights of five machines each. Immediately after taking off they tucked themselves into the tightest possible formation—about four feet separating wing-tip from fuselage—and, as far as one could see, remained almost immovably spaced whilst they performed slow rolls, half rolls and loops in quick succession. Each flight then indulged in a remarkable display of converging bombing, and, finally, the two flights united in V formation and approached the aerodrome with the leader level, but each succeeding machine flying on its sides alternately at 45 degrees. The effect was most striking and not a little funny; altogether a very fine show which could hardly have been improved upon.

The journey back to Budapest (by road) rivalled Hendon at its worst and, consequently, many of the party were somewhat late in assembling for the final farewell dinner, which brought to a conclusion the fourth Magyar Pilota Picnic.

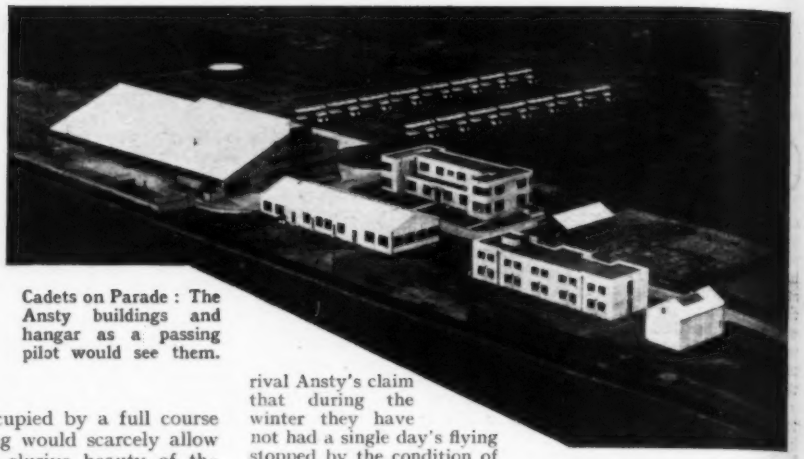
AT A DIFFERENT KIND OF PICNIC.—The recent S.B.A.C. Display Banquet. Right to left : Mr. A. E. Chorlton, M.P., Mr. T. G. John, Sir William McLintock, Sir Henry White-Smith, Sir Alliott Verdon-Roe, Comdr. Harold Perrin, Capt. J. Lawrence Pritchard, Air Comdre. J. A. Chamier and (with back to camera) Mr. G. F. Johnson

"Civil" Schools Visited

ANSTY

How Pupils at the A.S.T. School Near Coventry Gain Experience for Direct Entry Into the R.A.F.

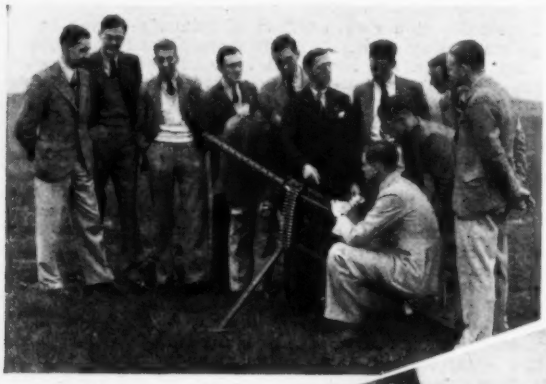
Illustrated with *Flight* photographs.



Cadets on Parade: The Ansty buildings and hangar as a passing pilot would see them.

THE intensive eight weeks occupied by a full course of flying and ground training would scarcely allow the pupil to appreciate the elusive beauty of the Midland countryside, so it is sufficient to say that at Ansty Aerodrome one looks out on pleasant, serene fields and trees and that round about is good flying country. This school, operated by Air Service Training, Ltd., may be more accurately described as being near a place rejoicing in the delightfully bucolic name of Walsgrave-on-Sowe, situated within a few miles of Coventry. It is modern in every way. The first peg was driven into the embryonic flying-field some eighteen months ago, and ffom that moment the rapidity of growth and development in the hands of J. B. Carr, the constructional engineers, has been quite extraordinary; sand-coloured clubhouse and catering section, administration and instruction buildings and sleeping quarters have sprung up in a modern squat-and-square style with wide metal-framed windows, and even a squash court has been provided for the little community. The housing of the machines and servicing section is in one large hangar with concrete apron.

Less than two years ago, one might have seen several sloping ploughed fields with hedges, trees and ditches on the site which is now Ansty Aerodrome, and it is seemingly impossible that in so short a time this could be transformed into the slightly "humped" but gently graded grass area to be seen now. There are very few flying units, even among those which have existed for many years, which can rival Ansty's claim that during the winter they have not had a single day's flying stopped by the condition of the field.



Ground Instruction: The intricacies of the Vickers' pilots gun, the Williamson L.B. aerial camera, and triangles of velocities, revealed to the pupils.

In batches of about thirty, A.S.T. take young men, mostly raw to flying, who have applied for entry into the R.A.F. In their eight-weeks' sojourn at Ansty they have to embrace a good working knowledge of airmanship, navigation, engines, aircraft construction and rigging and armament. In the same time about fifty hours' flying are completed, of which twenty-five are solo. The usual period of dual instruction before the first solo is about ten hours, but fifteen hours is the maximum allowed under normal circumstances. The equipment is at present sixteen Avro Cadets, which are really first-class training machines, able to stand much knocking about and having at the same time a good performance bestowed by their Armstrong Siddeley Genet Major engines.

A section of the Volunteer Reserve also operates from Ansty and plans for its expansion are in hand. Extra office accommodation is being built and the foundations for a second large hangar are in course of preparation. Avro Cadets and Miles Magisters will be used for the *ab initio* training, but two Hart trainers and four Audax will be supplied for intermediate and advanced training. The Volunteer Reserve course is exactly similar to the special condensed course but takes six months of occasional evenings and week-ends, and one continuous period of fifteen days, instead of eight weeks continuously. The full-time course is, incidentally, increased to nine weeks in the winter months.

Seven complete courses, passing out some two hundred pupils, have now been completed at Anstey. Towards the end of a period each newly fledged pilot is subjected to a flying test in which

In this specially built room, pilots are instructed in the method of folding and packing a parachute.

he takes the official examiner up for twenty minutes or so; in addition to normal flying he has to make a forced landing approach, do some aerobatics and, perhaps, a few minutes under the hood. Two 120-mile cross-country flights will previously have been completed. The ground examination is in airmanship, air navigation, rigging and engines.

The first building seen on approaching the aerodrome up the drive is the Carter squash court, and opposite is laid down the hard green Gaze-type tennis court.

Next on the left come the sleeping quarters, to house about thirty, a neat little bedroom with hot and cold water and a fitted cupboard being allotted to each man living-in. Accommodation is found in the village for several more who cannot be fitted in at the aerodrome, and they have a separate mess.

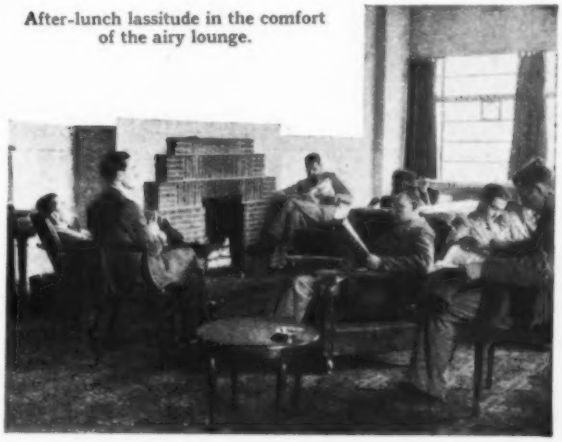
The club, situated next to the sleeping quarters, has a large, well-lighted lounge and a mess looking out over fields and a garden, which is at present being laid out. The kitchens and billiards-room are on the drive side of the building.

In the two-storey ground-instruction building are found a well-equipped armament section over which Mr. C. T. Beardow presides; a parachute room under Mr. L. H. B. Read; navigation, aircraft and engine lecture rooms; photographic department, with dark room—this is Mr. C. F. Jones' province; lockers for pupils; and rooms for the chief instructor, Flt. Lt. R. P. P. Pope, and his secretary and the chief ground instructor Lt. Cdr. H. S. Cooper. Further practical instruction in engine and aircraft servicing is given in the large hangar built by Wilfred Robbins, Ltd., of Great Bridge, Staffs.

To give an idea of the life led by an Ansty pupil, let us take one representative day's programme. Reveille at 7.30 a.m. is followed by some twenty minutes exercises and a bath before breakfast is served. On arrival at Ansty each new contingent is evenly divided into an "A" and a "B" section, A section flying while B section receives class instruction, and vice versa. Work begins at 9 a.m. with A section flying and B section in the lecture rooms. At 10.30 a break is called and A and B sections change over duties and continue work until 12.30 p.m. A lunch period of 1¼ hours is allowed and work begins again as in the morning, continuing until 5 p.m. The afternoon change-over break is from 3.15 to 3.30 p.m. Free time for games and other recreations follows afternoon instruction from 5 p.m. onwards, and at week-ends—which are all free time—pupils may have leave for one night.

The ground-instruction course is quite intensive, and although there is no set "home-work" most people find a little extra time almost essential in order to keep pace.

After-lunch lassitude in the comfort of the airy lounge.



Ansty staff and instructors pose for our photographer. (Left to right) Mr. C. J. Beardow, Mr. P. E. Baxter, Flt. Lt. W. F. Lovering, Mr. E. F. Godfray, Mr. B. R. Tribe, Mr. G. H. Wright, Flt. Lt. A. W. M. Finny, Lt. Cdr. H. S. Cooper, Mr. C. F. Jones, Mr. T. W. Hamlin, Flt. Lt. R. P. P. Pope, D.F.C. (chief instructor), Flt. Lt. W. C. Sheen (liaison officer), F/O L. W. Howard, Flt. Lt. J. B. Veal (chief flying instructor), Flt. Lt. A. D. Bennett, Mr. L. H. B. Read, Mr. J. F. Dickie and Flt. Lt. P. V. Williams.

FULL-SIZE ECONOMY

The Cirrus-engined Wicko Cabin Monoplane : Production Features : Interesting Flying Qualities

SOME time ago we published details and a few impressions of a cabin monoplane which had been flying quite successfully with a converted Ford Vee-Eight engine. Although the Ford-engined model still remains as an interesting possibility, the Wicko monoplane is now in serious production with the 90 h.p. Cirrus Minor engine, which gives it a useful performance coupled with a very reasonable degree of economy and full cabin comfort for two people and their luggage. The machine actually cruises at something rather better than 100 m.p.h. while using a matter of four and a quarter gallons of fuel in the hour.

The Foster Wikner Aircraft Company, who are making the machine, have now settled down in their Southampton Airport quarters and the first production machine should be out within the next month or two. This will probably be fitted with a Cirrus Major engine and it seems, if rumour is to be believed, that it will fly in the King's Cup race next September. The prototype Wicko has a number of features which, in the light of experience, will be modified in the production model, and one's impressions must necessarily be confined to those of flying characteristics—which are interesting enough.

THE WICKO CABIN MONOPLANE
90 h.p. Cirrus Minor Engine

Span	31ft. 6in.
Length	23ft. 3in.
Weight empty	938 lb.
Useful load	562 lb.
Payload	220 lb.
Maximum speed	120 m.p.h.
Cruising speed	103 m.p.h.
Landing speed	40 m.p.h.
Cruising range	450 miles.
Price	£650

Makers: Foster Wikner Aircraft Co., Ltd., Southampton Airport.

The production machine, for instance, will be an entirely ply-covered structure, while the prototype has fabric-covered wings. Again, the cabin will be five inches wider, the roof window area will be increased, there will be two doors of ample width and an oil-damped undercarriage. The structure will be of a straightforward type, designed for easy production and maintenance, consisting of a "box"-type fuselage and two-spar strut-braced wing. Inspection doors are provided in the skin of the wing so that the control and attachment points may be reached without difficulty, and Mr. Wikner has evolved a simple method of building up the fuselage without the use of expensive jigs or of later readjustment. Both the sides and the upper and lower surfaces are jigged up complete with split longerons, and the four ready-made surfaces can be erected very simply, each split longeron becoming, in the process, a laminated whole.

However, apart from the lack of the normal trailing-edge flaps which will be found on later models, the prototype may be taken as possessing exactly the same flying characteristics. The slight extra weight involved in the ply construction should be balanced in the matter of performance by the greater cleanliness of the design, and the flaps should both bring landing speed down and improve the take-off—which is already quite convincing.

It is customary for pilots to demand what are known as harmonised controls—each being of the same weight and efficiency. The three controls of the Wicko are quite unlike one another, yet one would not care to have them altered. The machine can be flown indefinitely on the light and effective rudder (hands are more useful than feet when there are other jobs to be done), the unused ailerons are on the heavy side but are fully effective right down to the stall, and the elevators are effective but not too light. Curiously enough, there is very little change of trim between the full and closed positions of the throttle, and cruising trim can be adjusted really accurately by throttle action.

Approaches

Up to any reasonable angle the ailerons need not be used in a turn and the machine takes up its own bank as soon as a little rudder is applied. Only in steeper turns is it necessary to apply a light pressure on the stick to hold the nose up. Although no form of air brake is fitted to the prototype, one is soon accustomed to the flat angle of approach, for the machine's sideslip is so virile and controllable that there should be no question of overshooting. Three approaches were made without previous experience of the machine and no difficulty was experienced in adjusting any one of them so that a landing could be made within fifty yards or so of the boundary. The great thing is to get one's speed down to 60 m.p.h. in the early stages of the approach. A sideslip, whether steep or flat, can be held at 60 m.p.h. or less while using about half the rudder's range of movement, and the machine is almost uncannily stable during the process; there is no tendency for the machine to demand more and more rudder and aileron, or to "build up" in such a way that a change of bank is necessary. Landing is a very simple business.

At the stall the Wicko appears to be without vice, though no doubt it would be possible to spin it with due provocation. The machine can be held up at an indicated 40 m.p.h. without dropping either its nose or a wing, though the sink is, of course, necessarily pronounced. When stalled with the engine on or off the nose drops below the horizon as soon as the stick is released and the machine automatically picks up its cruising or gliding angle if left to itself. Altogether, the stalling characteristics provide interesting possibilities in the way of approach technique, though it would hardly be safe to carry the sink much below 500ft. in anything but fairly calm conditions.

It would not be useful to discuss the machine from the occupant's point of view, since the production machine will be considerably modified in detail, but even now the standards of view, silence and general comfort are reasonably good—and they improve with acquaintance.

A Carburettor "Shadow Factory"

IT is announced that H. M. Hobson (Aircraft and Motor) Components, Ltd., acting on behalf of the Air Ministry, have been entrusted with the equipment and management of the carburettor "shadow factory" at Woodstock Mill, Oldham, Lancs.

Production of Hobson master control units, comprising Claudel-Hobson carburettor, Hobson induction pressure (boost) control, and Hobson-Penn automatic mixture control, is being started forthwith.

THE ROYAL AIR FORCE

SERVICE NOTES AND NEWS — AIR MINISTRY ANNOUNCEMENTS

OUT OF THE PAST: A German L.V.G. biplane which played its part at the Hendon Display.

NEW DIRECTOR OF ORGANISATION

The Air Ministry announces the following appointment:—Air Vice-Marshal Charles Frederick Algernon Portal, D.S.O., M.C., to be Director of Organisation, Air Ministry with effect from September 1, vice Air Vice-Marshal William Lawrie Welsh, C.B., D.S.C., A.F.C.

Air Vice-Marshal C. F. A. Portal was appointed to the Royal Flying Corps from the Royal Engineers in 1915 and gained the Royal Aero Club Certificate (No. 2543) on March 9, 1916. During the Great War he served in France, and for his conspicuous gallantry was awarded the M.C., the D.S.O. and Bar, besides being mentioned in despatches on three occasions. He was granted a permanent commission in the Royal Air Force, with the rank of Squadron Leader, in August, 1919.

Since the Great War Air Vice-Marshal Portal has commanded No. 7 (Bomber) Squadron, has held an appointment on Air Staff Duties at the Air Ministry, and has passed courses at the Royal Air Force Staff College, the Royal Naval College, and the Imperial Defence College. In 1934 he was appointed Officer Commanding, British Forces in Aden, and since January, 1936, has been a member of the instructional staff of the Imperial Defence College. He was promoted to Wing Commander in 1925, to Group Captain in 1931, to Air Commodore in 1935, and to his present rank on July 1, 1937.

FORMATION OF STATION HEADQUARTERS

A station headquarters will form at Stradishall, Cowlinge, Newmarket, Suffolk, on August 30, on which date the station will be placed under the command of the A.O.C.-in-C., Bomber Command, in No. 3 (Bomber) Group.

MOVE OF A SQUADRON

No. 44 (Bomber) Squadron moved from Andover to Waddington on June 16, on which date it was transferred, within the Bomber Command, to No. 3 (Bomber) Group.

No. 3 FLYING TRAINING SCHOOL

No. 3 Flying Training School will move from Grantham to Cirencester in August—not, as announced last week, to South Cerney.

NOMENCLATURE OF AIRCRAFT

The name of the Hawker bomber aeroplane fitted with Merlin engine is Henley I.

MOVING WESTWARD

It has been announced that an £800,000 contract for the erection of a Royal Air Force supply depot, at Kingmoor, near Carlisle, has been placed with Laing and Son, Ltd., builders, of Carlisle. The site covers several square miles, and the headquarters block will be on the main Glasgow road at Harker, near Carlisle airport.

FLYING ACCIDENT

The Air Ministry regrets to announce that Sergt. Edward Moorhouse, A/C.1 Sydney Herbert William Coomber, and A/C.2 Alfred George Martin lost their lives in an accident which occurred near Bridgnorth, Salop, on June 30 to an aircraft of No. 90 (Bomber) Squadron, Bicester. Sergt. Moorhouse was the pilot and the other two airmen were the passengers of the aircraft.

HALF-YEARLY PROMOTIONS

The Air Ministry announces:—The undermentioned promotions are made with effect from July 1, 1937:—

GENERAL DUTIES BRANCH

Air Marshal to be Air Chief Marshal

Sir Edgar Rainey Ludlow-Hewitt, K.C.B., C.M.G., D.S.O., M.C.

Air Vice-Marshal to be Air Marshal

William Gore Sutherland Mitchell, C.B., C.B.E., D.S.O., M.C., A.F.C.

Air Commodores to be Air Vice-Marshals

John Tremayne Babington, C.B.E., D.S.O., Owen Tudor Boyd, O.B.E., M.C., A.F.C., Arthur William Tedder, C.B., Bertine Entwisle Sutton, D.S.O., O.B.E., M.C., and Charles Frederick Algernon Portal, D.S.O., M.C.

Group Captains to be Air Commodores

Arthur Claud Wright, A.F.C. (promoted under the provisions of the last sentence of Paragraph 354, Clause I (b) of King's Regulations and Air Council Instructions), Richard Ernest Saul, D.F.C., William Bertram Callaway, A.F.C., Arthur Travers Harris, O.B.E., A.F.C., and Thomas Edward Barham Howe, C.B.E., A.F.C.

Wing Commanders to be Group Captains

William Sowrey, D.F.C., A.F.C., Claude Russell Cox, O.B.E., A.F.C., James Milne Robb, D.S.O., D.F.C., Harold Melsome Probyn, D.S.O., John Leacroft, M.C., Leonard Horatio Slatter, O.B.E., D.S.C., D.F.C., Charles Edward Hastings Medhurst, O.B.E., M.C.

(Acting Group Captain), Alan Lees, A.F.C., Augustus Henry Orlebar, A.F.C., Henry Karslake Thorold, D.S.C., D.F.C., A.F.C., John Oliver Andrews, D.S.O., M.C., Eric Digby Johnson, A.F.C., Roger Henry Gartside Neville, O.B.E., M.C., Albert Peter Vincent Daly, A.F.C., Claude Hilton Keith, Wyndham Brookes Farrington, D.S.O., George Clark Pirie, M.C., D.F.C. (Acting Group Captain), John Cotesworth Slessor, M.C. (Acting Group Captain), William Douglas Budgen, O.B.E., John Joseph Breen, O.B.E., Patrick Huskinson, M.C., Lionel Guy Stanhope Payne, M.C., A.F.C., Theodore Quintus Studd, D.F.C., Claud William Mackey, and Brian Edmund Baker, D.S.O., M.C., A.F.C.

Squadron Leaders to be Wing Commanders

Kenneth Harries Riversdale-Elliot, D.S.O. (promoted under the provisions of the last sentence of Paragraph 354, Clause 1 (b) of King's Regulations and Air Council Instructions), Charles Kingsley Chandler, M.B.E., Ruthven Montgomerie Chase Macfarlane, M.C., James MacGregor Fairweather, D.F.C., Robert Mordaunt Foster, D.F.C., Stephen Charles Strafford, D.F.C., Andrew MacGregor, M.B.E., D.F.C., Douglas Leslie Blackford, Ivor Morgan Rodney, Harold Thomas Lydford, A.F.C., Frank Linden Hopps, A.F.C., Charles Edmund Maitland, D.F.C., A.F.C., Archibald James Rankin, O.B.E., A.F.C., Charles William Attwood, Frederick Robert Wynne, M.B.E., Alick Charles Stevens, Cecil George Wigglesworth, A.F.C., Arthur Hyde Flower, Harold John Collins, William Munro Yool (Acting Wing Commander), Robert Rule Graham (Commander, R.N.), and Henry Lockhart St. John Fancourt (Commander, R.N.).

Flight Lieutenants to be Squadron Leaders

Thomas James Edward Thornton, Edward Frederick Thorpe, Arthur Henry Simmonds, Frederick Horace Cashmore, Vernon Frank Whatling, D.S.M., Harold Featherstone Luck, Douglas Donald MacAlister Eastwood, Alan Brock (Lt.-Cdr., R.N.), James Edmund Fenton (Lt.-Cdr., R.N.), and Ernest Henry Shattock (Lt.-Cdr., R.N.).

Flying Officers to be Flight Lieutenants

Alan Charles Newson (Lt., R.N.), Henry John Fullerton Lane (Lt., R.N.), William Paulet Lucy (Lt., R.N.), Arthur Richard Burch (Capt., R.M.), George William Robert Nicholl (Lt., R.N.), Neil McIntyre Kemp (Lt., R.N.), John Charles Hugh Price (Lt., R.N.), Edmund Gerard Clutton (Lt., R.N.), William John Lucas (Lt., R.N.), and Bernard William de Courcy-Ireland (Capt., R.M.).

EQUIPMENT BRANCH

Wing Commander to be Group Captain

William Boston Cushion, O.B.E.

Squadron Leaders to be Wing Commanders

Arthur Elias Sutton-Jones, Edwin Harold Eldridge, Maurice Jewison James, M.B.E., Frank Noel Trinder, Kenneth Dowsett Gould Collier, and John Victor Mason, O.B.E.

ACCOUNTANT BRANCH

Squadron Leaders to be Wing Commanders

Percy Jack Farmer, Ralf Harry Cleverly, and Geoffrey Noel Simon.

MEDICAL BRANCH

Squadron Leaders to be Wing Commanders

Edwin Noel Hillman Gray, L.R.C.P. & S., D.P.H., Thomas Vincent O'Brien, M.B., Ch.B., Hugh Wolfe Corner, M.D., Ch.B., M.R.C.P., and Frank Paul Schofield, M.B., B.S., M.R.C.S., L.R.C.P., D.M.R.E.

DENTAL BRANCH

Wing Commander to be Group Captain

Lawrence Somerville-Woodiwis, L.D.S.

Squadron Leader to be Wing Commander

Gordon Arthur Ballantyne, D.F.C., L.D.S.

Flight Lieutenant to be Squadron Leader

Michael Joseph Pigott, B.D.S.

ROYAL AIR FORCE INTELLIGENCE

Appointments.—The following appointments in the Royal Air Force are notified:—

General Duties Branch

Group Captain.—A. T. Harris, O.B.E., A.F.C., to Headquarters, No. 4 (Bomber) Group, Mildenhall; to command, 12.6.37.

Wing Commanders.—E. I. Bussell, to R.A.F. Station, Hendon; to command, 6.6.37. J. Cottle, M.B.E., D.F.C., to R.A.F. Depot, Uxbridge; for Administrative duties, 6.6.37. S. D. Culley, D.S.O., to Headquarters, No. 4 (Bomber) Group, Mildenhall; for Air Staff duties, 1.6.37. E. J. L. Hope, A.F.C., to No. 72 (Fighter) Squadron, Church Fenton; to command, 9.6.37. J. A. McDonald, to Headquarters, No. 11 (Fighter) Group, Uxbridge; for Signals duties, 23.6.37. D. S. Allan, to No. 1 Anti-Aircraft Co-operation Unit, Biggin Hill; to command, 8.6.37. G. A. R. Muschamp, to No. 37 (Bomber) Squadron, Feltwell; for flying duties, 9.6.37. R. A. A. Cole, to No. 51 (Bomber) Squadron, Boscombe Down; for flying duties, 7.6.37. G. H. Huxham, to No. 78 (Bomber) Squadron, Dishforth; for flying duties, 7.6.37. H. A. Evans-Evans, to Headquarters, No. 4 (Bomber) Group, Mildenhall; for Signals duties, 7.6.37.

Squadron Leaders.—N. V. Moreton, to No. 45 (Bomber) Squadron, Helwan, Egypt; to command, 14.5.37. J. H. McC. Reynolds, to No. 33 (Bomber) Squadron, Ismailia, Egypt, 10.5.37. J. Turner, to No. 4 Flying Training School, Abu Sueir, Egypt; for Engineer duties, 21.5.37. W. H. Poole, A.F.C., M.M., to Headquarters, No. 4 (Bomber) Group, Mildenhall; for Air Staff duties, 9.6.37. R. Kellett, to No. 148 (Bomber) Squadron, Scampton; to command, 9.6.37. R. B. Sutherland, D.F.C., to No. 50 (Bomber) Squadron, Waddington; to command, 11.6.37. R. J. M. de St. Leger, to Headquarters, No. 4 (Bomber) Group, Mildenhall; for Air Staff duties, 27.4.37. N. C. Ogilvie Forbes, to Headquarters, No. 3 (Bomber) Group, Mildenhall; for Navigation duties, 21.6.37. W. A. Tattersall, to No. 58 (Bomber) Squadron, Upper Heyford; for Flying duties, 17.6.37. W. G. Campbell, to No. 22 (Torpedo Bomber) Squadron, Donibristle; to command, 27.4.37. N. C. Pleasance, to No. 82 (Bomber) Squadron, Andover; to command, 14.6.37. A. P. Revington, to School of Air Navigation, Manston, 1.6.37.

Flight Lieutenants.—R. B. Wardman, to No. 612 (Co. Aberdeen) (Army Co-operation) Squadron, 1.6.37. R. C. M. Collard, to No. 615 (Co. Surrey) (Army Co-operation) Squadron, 1.6.37. R. G. S. Morgan-Smith, to No. 614 (Co. Glamorgan) Squadron, 1.6.37. P. B. Wood, to No. 13 (Army Co-operation) Squadron, Odiham, 8.6.37. G. R. Howie, to No. 166 (Bomber Squadron), Leconfield, 7.6.37. E. B. Grace, to No. 4 Flying Training School, Abu Sueir, Egypt, 1.5.37. I. B. Newbigging, to No. 22 (Torpedo Bomber) Squadron, Donibristle, 10.6.37. F. G. Frow, to No. 98 (Bomber) Squadron, Hucknall, 12.6.37. S. E. Mackenzie, to Special Duty List; on appointment as Aide-de-Camp to the Governor of Northern Rhodesia, 5.6.37. G. F. Overbury, to No. 84 (Bomber) Squadron, Shaibah, Iraq, 22.5.37. L. F. Sinclair, to Headquarters, R.A.F., India, Simla, 8.5.37. F. C. Daubney, to No. 20 (Army Co-operation) Squadron, Peshawar, India, 20.4.37. A. V. Bax, A.F.M., H. R. A. Edwards, P. W. Bale, B. K. Burnett, T. U. Rolfe, and J. A. P. Owen, to School of Air Navigation, Manston, 1.6.37. R. J. Gosnell, to No. 11 Flying Training School, Wittering, 8.6.37.

Flying Officers.—H. H. Peck, to No. 1 (Fighter) Squadron, Tangmere, 3.6.37. J. A. C. Fuller, P. S. G. Cunningham, W. S. G. Maydwell, and E. R. E. Black, to No. 1 Flying Training School, Leuchars; on appointment to commissions on being seconded from the Army, 19.5.37. P. A. McWhannell, R. G. Musson, L. B. B. King, A. T. D. Sanders, to School of Air Navigation, Manston, 1.6.37.

Pilot Officers.—K. C. Doran and H. D. Green, to No. 110 (Bomber) Squadron, Waddington, 7.6.37. A. M. Brown, L. G. Burnand, K. D. Currie, and D. R. Hopper, to No. 208 (Army Co-operation) Squadron, Heliopolis, Egypt, 27.5.37. A. M. Bentley, to No. 223 (Bomber) Squadron, Nairobi, 10.4.37. J. H. Barratt, B. C. Bell, F. C. Phipps, H. F. Thomson, and E. M. Ware, to No. 3 Flying Training School, Grantham; on appointment to permanent commissions, 4.5.37. C. J. Donovan, to Air Observers School, North Coates Fitties, 28.5.37. E. P. Mortimer, to No. 2 Flying Training School, Digby, 31.5.37. A. Beck, to No. 3 Flying Training School, Grantham, 31.5.37. D. E. Baxter, to No. 5 Flying Training School, Sealand, 1.6.37. J. A. Coltart, to No. 7 Flying Training School, Peterborough, 1.6.37. D. E. A. Williams, to No. 8 Flying Training School, Montrose, 5.6.37. G. F. Hall, W. Kinane, to No. 82 (Bomber) Squadron, Andover, 14.6.37.

Acting Pilot Officers.—F. O'Driscoll, to No. 110 (Bomber) Squadron, Waddington, 7.6.37. R. N. Bateson, R. R. Helsby, and B. A. Mitchell, to No. 113 (Bomber) Squadron, Upper Heyford, 4.6.37. R. B. Langlois, D. J. H. Lay, F. T. May, E. T. Williams, and C. S. F. Wood, to No. 6 (Bomber) Squadron, Ismailia, Egypt, 10.4.37. H. D. Card, C. G. S. Robinson, D. C. Stapleton, and J. W. B. Vernon, to No. 14 (Bomber) Squadron, Amman, Transjordan, 10.4.37. R. N. Belgrove, R. I. Collier, E. H. Dally, H. P. Pleasance, and P. P. Troughton-Smith, to No. 45 (Bomber) Squadron, Helwan, Egypt, 10.4.37. E. C. Cathels, D. T. St. H. Dawes, G. A. Roden, to No. 47 (Bomber) Squadron, Khartoum, 10.4.37. G. W. de V. Le Sueur, L. H. W. Parkin, D. G. Tomlinson, J. L. Beck, A. W. Heward, T. G. Kirby-Green, K. T. A. Harvey, E. J. Hetherington, P. H. Jackson, and R. P. Wallace-Tarry, to No. 216 (Bomber Transport) Squadron, Heliopolis, Egypt, 27.5.37. G. W. Jones, to No. 1 Armoured Car Company, Hinaidi, 27.5.37. G. C. Kain, D. F. Laslett, G. E. M. Schrader, P. M. Compston, G. V. Gordon, E. A. Williamson, J. T. I. Challes, R. C. Dundas, D. W. Lindsay, and E. J. Sheeran, to No. 70 (Bomber Transport) Squadron, Hinaidi, Iraq, 27.5.37. J. Hobbs, C. S. P. Russell, to No. 3 Flying Training School, Grantham, 9.6.37. J. D. W. Murray, to No. 10 Flying Training School, Tern Hill, 8.6.37.

Medical Branch

Flight Lieutenants.—W. G. S. Roberts, to R.A.F. Station, Dhibban, Iraq, 19.5.37. H. E. Bellringer, to R.A.F. General Hospital, Iraq, Hinaidi, 16.5.37. W. J. L. Dean, to No. 84 (Bomber) Squadron, Shaibah, Iraq, 11.5.37. G. H. J. Williams, to No. 6 Flying Training School, Netheravon, 14.6.37. R. N. Kinnison, to Princess Mary's R.A.F. Hospital, Halton, 17.6.37.

Chaplains Branch

Revd. P. J. Macken, to R.A.F. Depot, Uxbridge; for duty as Chaplain (C. of E.), 11.6.37.

OVER THE HILLS....

The Newcastle Trophy Race Won by Mr. Charles Gardner (Mew Gull) at 221 m.p.h. from Scratch : Mixed Weather—Mainly Bad

AFTER receiving so comparatively few entries for their annual race, the Newcastle Aero Club suffered a special stroke of evil in the form of bad weather on Saturday. After a particularly dull afternoon, with intermittent rain and a ceiling of never more than a few hundred feet, a thunderstorm was adding to the general discomfort of all concerned when Mr. Charles Gardner, the scratch man, in his recently acquired Mew Gull, crossed the line to win at the record average speed of 221 m.p.h.

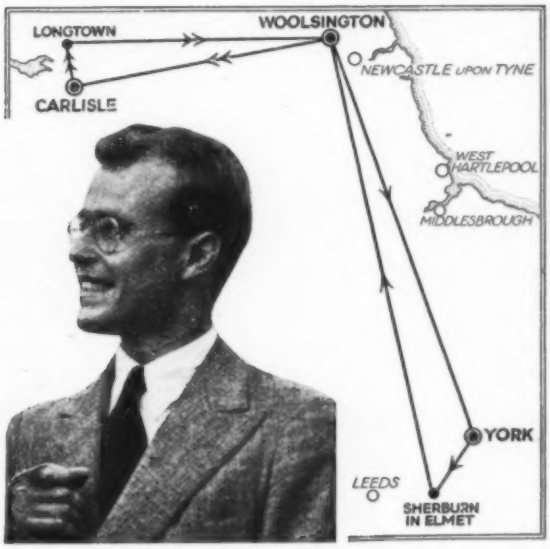
Only six of the eight other competitors finished the course, Flt. Lt. Tommy Rose and Mr. R. P. G. Williams, both with B.A. Eagles, abandoning the race after completing the first section from Newcastle to York and return. Apparently, by a coincidence, both their engines were mildly recalcitrant after the stop at York. The finishing order was as follows:—

Machine.	Pilot.	Handicap. Hr. min. sec.	Time. Hr. min. sec.	Speed. M.p.h.
1. Mew Gull ...	C. Gardner	Scr.	1 17 43	221
2. T.K.2 ...	G. de Havilland ...	0 19 32	1 39 57	172
3. Mew Gull ..	A. Henshaw	0 0 41	1 21 37	210.5
4. B.A. Eagle ...	H. F. Broadbent ..	0 46 58	—	—
5. D.H. Moth ...	J. R. Micklethwait ...	1 19 13	—	—
6. B.A. Swallow .	W. M. Mackay ...	1 29 41	—	—
7. Puss Moth ...	S. Smith	0 56 27	—	—

Mr. Gardner was duly awarded the Newcastle-upon-Tyne Trophy and £150, Mr. De Havilland collected £50 and Mr. Henshaw a useful £25. An additional prize of £10 for the fastest time was also won by Mr. Gardner.

Weather conditions generally were pretty mixed—with the accent on badness—and the handicappers appear to have had the usual trouble with varying wind speeds. Whereas a flat calm prevailed at Woolsington when the competitors left through smoke and mist, a strong and bumpy wind was encountered inland. Some idea of the changing conditions may be gathered from the fact that De Havilland's speeds in the T.K.2 were 142 m.p.h. from Newcastle to York, 202 m.p.h. from York, via Sherburn and Newcastle, to Carlisle, and 172 m.p.h. over the entire course. Towards the end of the race the weather was quite appalling, with smoke and pouring rain. As appears to be customary in these parts, the weather changed entirely for the benefit of the leaders within half an hour or so when entering and leaving the Carlisle control.

All things considered, the finish was reasonably close, with the three leaders coming in within three minutes of each other after a 274-mile race. The T.K.2 beat Henshaw's Mew Gull by half a minute.



The course for the Newcastle Trophy Race, which was won by Mr. C. Gardner (inset). In previous years this event has been known as the London-Newcastle Race and was run over the course implied by its name.

As already explained in *Flight*, the race this year had, instead of the usual London to Newcastle course, a local one with controls at York and Carlisle. The course was, in fact, Newcastle - York - Sherburn - Newcastle - Carlisle - Longtown - Newcastle, with stops of twenty minutes at York and Carlisle. By so confining the race it is possible that the entries were discouraged in spite of the worth-while prizes, and there will probably be much thinking before the course for the next race is decided upon. However, those competitors who came up specially for the event could not complain of the hospitality accorded them.

The dinner-dance, held in the Royal Station Hotel, Newcastle, on the same night was a delightful affair and was well attended. Tributes to the pilots who had taken part in the race were paid by the Lord Mayor of Newcastle (Alderman John Grantham) and by the Sheriff (Councillor A. D. Russell) before the Lady Mayoress presented the trophy to Mr. Gardner. Responding to the toast of "The Guests," Flt. Lt. Rose said that he had been flying for twenty-three years and unhesitatingly he would put the first three finishers in the race as the three best amateur pilots in the country to-day (—and Mr. G. de Havilland, though one of our more experienced test pilots, can really be considered as an "amateur."—ED.). Among others present were Sir Joseph Reed (President of the Club) and Lady Reed, the Deputy Lord Mayor and Lady Mayoress (Councillor and Mrs. R. J. Richardson), Wing Commander Guy Y. Tyrrell, M.C. (O. C. Usworth), Flt. Lt. and Mrs. S. H. Potter (from Carlisle), Capt. J. D. Irving (Chairman of the Club) and Mrs. Irving.

Altitude Record : Royal Congratulations

FOLLOWING Flt. Lt. Adam's successful attack on the height record (described on pages 52a and 52b), the following message was received by Viscount Swinton, Secretary of State for Air, from Buckingham Palace:—

"The King was interested and gratified to hear that a Royal Air Force Officer had regained the altitude record for this country, by attaining a height of practically 54,000ft.

"His Majesty will be glad if you will convey to Flight Lieutenant M. J. Adam his sincere congratulations on this very remarkable feat.

HARDINGE."

Other congratulatory messages received by the Air Ministry included the following, from Mr. Handley Page, chairman of the S.B.A.C.:

"The Council and Members of the S.B.A.C. have the greatest pleasure in congratulating the Royal Air Force on once again capturing the world's height record."

The secretary of the Air Ministry, Sir Donald Banks, replied as follows:—

"Air Council and Royal Air Force greatly appreciate the message of congratulation from the Council and Members of the Society on the success of the recent high altitude flight. This success will be recognised as one which reflects highest credit on aircraft and aero engine designers and constructors in this country."

Coal-Petrol and the R.A.F.

AT the annual general meeting of Low Temperature Carbonisation, Ltd., the chairman, Col. W. A. Bristow, reminded his audience that during the period 1931-1933 the whole of the company's output of coal-petrol was reserved for the Royal Air Force. Since that time they had supplied an increasing number of home defence squadrons with this fuel, and, according to a recent statement by the Under-Secretary of State for Air, it was intended to increase the amount used.

COMMERCIAL AVIATION

FOR AIR SURVEY : On Thursday of last week the B.A. Double Eagle, which has been specially laid out for survey work, left Hanworth for Johannesburg. It is being flown out by Mr. Brian Russell, the chief pilot of the Aircraft Operating Company of Africa, and was described and illustrated in *Flight* of April 29

THE WEEK AT CROYDON

Ceremonial : Parking Problems : Home from School : Elopement

AFRICAN Chief Alake Abeokuta, magnificently robed, together with his daughter Ademola, in flowing robes and a Paris model "halo" hat, left Croydon one day last week by Imperial Airways for Paris. The ceremony was made the more impressive (seeing that the weather was British) by the presence of a huge and solemn umbrella-bearer walking just behind his chief with the State Umbrella. Luckily this official neither tried to enter the machine (the umbrella not being made to fold up), nor was he caught by the slipstream and wafted, still sticking to his guns or clinging to his brolly, away through the skies towards London.

Our old friend *Hanno* has returned to Croydon after a lengthy absence out East on the Cairo-Karachi and other Eastern routes. *Hanno's* retirement from Eastern service is understood to be permanent, a flying boat having taken over his job. Capt. Poole, I.A.L., brought the machine home.

I have often wistfully wished that the airport authorities would take over machine-parking control on the tarmac, and now I wish they would look into car-parking problems, too. One comes to work in a car, of sorts, and parks it in accordance with regulations, facing Purley Way, behind the railings. Somebody, usually a devilish haughty chauffeur, parks a long Rolls-Royce or Bentley immediately behind one and at right angles to the rest of the cars, so that the poor airport employee in a hurry cannot get his car out at all. Nobody looks after the matter and nobody cares. If you have a cheap little car like mine the only way to get attention is to keep on backing into the offending vehicle until the offending chauffeur loses his cynical calm and hurriedly gets out of the way.

We hear of "singing mice"—which, I believe, are actually affected with asthma or something—but I was serenaded beneath my office window by what seemed to be a singing elephant, but which turned out to be one of the big passenger cars giving forth a high treble note. It went on for ages, with several drivers and mechanics apparently trying to teach it to sing a proper tune instead of just whining.

The famous German "ace," Col. Udet, landed at Croydon with two companions in three Messerschmitts last week. It is notable that these machines may not be wheeled or towed backwards, a thing the average tractor man is very apt to do with any ordinary aeroplane.

Queer things may happen in cargo compartments. One company here has had to issue instructions to the effect that photographic films must not be placed anywhere near any radium or radio-active freight because radium fogs films.

You may miss the bustle and activity of Empire arrivals here now that a number of Imperial Airways passengers arrive at Southampton, but the solar topee is by no means a rare bird even now. I saw no fewer than eight of them arrive from India by K.L.M. on one machine the other evening. It is interesting to see English men and English wives as excited as school kids home for the holidays when husbands, home on leave, meet their wives across the Customs barrier. Customs officials are very human at Croydon on these occasions and allow people to meet before the actual baggage clearance.

Olley Air Service had the 4 a.m. job of rushing a frantic father up to Carlisle in search of a daughter who, according to reports, was about to commit matrimony at Gretna Green. Eloping couples or stern parents may always rely on O.A.S. for a swift journey to Carlisle—"Change here for Gretna Green"—and quite a lot of such jobs come Capt. (Cupid) Olley's way.

A. VIATOR.

Co-ordination

WITH the new electric train service between London and Portsmouth and the usual P.S. and I.O.W. Aviation services, passengers will be able to make the best of both transport worlds—particularly as it is possible to book at any travel agency for this company. We have always insisted that rail and air are complementary services and should be treated as such.

New Lighting Standards

REVISED during last month, the British Standard Specification for Land Aerodrome and Airway Lighting should be read carefully by those who are professionally interested in such things, as various changes have been made since the specification was first published in 1934. To cite a small example, boundary lights were then expected to flash, whereas now, for a number of good reasons, they should be fixed in character.

SHORT-WAVE DIRECTION FINDING

Points About the New Marconi System : An Interesting Development for Long-range Work

NOW that Atlantic experiments have actually started in real earnest, this appears to be an opportune moment to describe one of the many radio developments which have made such long-distance services a practical possibility. It is well known that really useful wireless ranges can only be obtained with short-wave equipment and the difficulty has so far been that of developing a direction-finding system which, with the use of such short waves, will still be reliable and accurate.

The development and application in 1931, by Marconi's, of the Adcock principle to wireless direction-finding on medium wavelengths overcame the disadvantage of "night effect"—a natural phenomenon rendering other forms of D/F unreliable during the hours of darkness—and installations of this type have been put into service at nearly a hundred points. Until recently, however, the characteristics of wireless waves shorter than about 500 metres rendered them unreliable for D/F work with the available apparatus. Thus the very long ranges over which ordinary communication can be carried out with low-power transmitters on the short wavelengths were not available for direction-finding purposes. As an aid to aircraft navigation, direction-finding was limited to the comparatively short ranges obtainable with medium-wave aircraft transmitters—normally less than 300 miles.

The application, in short-wave apparatus, of the same principles which eliminated "night effect" from medium-wave D/F, has, with equal success, brought short wavelengths within the scope of accurate direction-finding services for long-range work. This feature is embodied in the Marconi Type DFg.12 installation, which covers a wave-range of 15-200 metres.

A peculiarity of short wavelengths is that they cannot travel far over the earth's surface. The energy which reaches the distant receiver is that which has been radiated away from the earth's surface at an angle and after reflection from the "heaviside layer" has come down again at a distance from its source (technically known as the "skip" distance), which varies to some extent with different wavelengths. These wavelengths cannot be received for D/F finding or any other purpose except at very short or very long ranges.

By good fortune it so happens that the distance at which many of the short wavelengths "come back to earth" coincides with the maximum range normally obtained by a medium-wave aircraft transmitter—round about 300 miles. It follows, therefore, that aircraft equipped with both short- and medium-wave apparatus can now be served by a ground D/F station fitted with both types of installation at all times of the day and night and at any distance up to 2,000 miles, or more, by the correct choice of wavelength to suit the time and distance.

Needless to say, the key feature of this short-wave development is the aerial system, which consists primarily of four vertical aerials situated at the corners of a square. The layout is, in effect, that of two rectangular loops at right angles to one another, with the horizontal top members eliminated and the horizontal bottom members screened and buried—the latter being brought to the stator coils of a goniometer placed at the centre of the whole system. The entire area covered is only a matter of twenty feet square—a great deal less than that required for medium-wave direction-finding.

I.C.A.N., 1937

A NUMBER of points were raised at the twenty-fifth session of the International Commission for Air Navigation, which was held between June 4 and 10 in Paris. Twenty-eight of the thirty-two parties to the 1919 Convention were represented.

The following were among the more important questions to be considered: (1) Standardisation of flying maps: Recommendations had been addressed to the contracting States and the Commission had drawn up a new programme for the publication of the different sheets of the basic international map published by itself. It has been decided that a new map shall be prepared for D/F work. It has been recommended that established frontier air corridors should be clearly marked. (2) Meteorology: The States have been invited to increase the interchange of climatological summaries through the I.C.A.N. Secretariat. (3) Radio: The Commission has proceeded with the final drafting of the regulations for the international radio-electric service and incorporated a new set of rules concerning the direction of aircraft in bad visibility, prescribing compulsory radio watch-keeping. (4) Journey log-books: The Commission has adopted a new model of the journey log which will be issued after April 1, 1938. (5) Fitness: New medical requirements have been laid down in relation to visual acuity and colour perception in different categories. (6) Accidents: It has been decided to invite the States to publish retrospective statistics of air accidents which have occurred during the last ten years. A model has been drafted for this purpose. The States have also been invited to exchange accident reports or the like from which useful information may be derived.

The next session will be held in May, 1938.

An Empire Mail Inauguration

WHEN a member of the top table of any gastronomic concourse of people is overheard to say that a very distinguished gathering is present, then surely few can deny it.

Such a remark was overheard on June 29 at a notable function, when some 250 guests of His Majesty's Government visited Southampton to witness the inauguration of the first stage of the Empire Air Mail scheme, whereby all letters and postcards are sent to East and South Africa by air.

The guests embarked at Southampton and made the journey down to Hythe on board the M.V. *Medina*. Riding between the special rafts of Hythe Pier was the good ship *Centurion*, with its commander, Captain F. J. Bailey, waiting to receive letters from H.M. the King. After brief speeches by the Rt. Hon. Viscount Swinton, G.B.E., M.C., Major the Rt. Hon. G. C. Tryon, M.P., Senator the Hon. C. F. Clarkson and Sir J. George Beharrell, D.S.O., the Royal letters were stamped, placed in a silk bag and sealed by a postman prior to handing over to Captain Bailey, who forthwith went aboard the *Centurion*. A slight hitch occurred with the starting of No. 1 port motor, but after a not unpleasant delay of thirty minutes *Centurion* took off and duly circled the M.V. *Medina*. During the passage out from Berth 46, sixteen different Power boats raced past the *Medina* at intervals—so that her passengers could learn something of the wide range of these craft. A number of them are now over in the Shannon.

Back at Southampton the party was entertained to a luncheon presided over by Viscount Swinton—at the conclusion of which it was announced that the *Centurion* had radioed her position as approaching Marseilles.

Commercial Aviation

TELEPHONY or ·— — —?

Some Trenchant Comments on the Telephony versus Telegraphy Business

By W. E. CROOK, A.M.I.E.E., A.F.R.Ae.S.

IN the application of wireless to air navigation there has always been a mild battle between telegraphy and telephony. Telegraphy, however, has obtained so sweeping a victory that the adherents of telephony may soon find themselves in much the same position as members of the Jacobite Society—regarded by everyone else with a sort of amused tolerance. Telephony has certain apparent advantages, but these advantages will hardly stand investigation.

First, it is often said, telephony is quicker. Your competent telegraphist may work at an average of twenty words a minute, whereas carefully enunciated speech is delivered at least four times as fast. As an arithmetical fact, this statement is unassailable, but in reality it is of no importance because the telegraphic code reduces messages to the shortest possible length. As an example, take a position report as it appears in telephony and telegraphy with the help of the "Q" code:

> Hallo Croydon So-and-so's G-EXYZ calling Passing Bexhill Making Berck Height one thousand metres Below cloud Over—or—GED de GEXYZ QTH Bxl QAB Berck QBH 1000 AR.

The telegraphy version can be sent comfortably in 20 to 25 seconds. The telephony version can be spoken in 15 to 20 seconds. At the very best then, in this instance, telephony is only about 65 per cent. faster. In some cases it is no faster and might even be a little slower—as in these:

> Hallo Croydon So-and-so's G-XYZ calling Request magnetic reciprocal bearing please Over.
>
> GED de GEXYZ QDM?

It may be possible to gabble into the microphone and beat the operator to the finish, but anyone who has experienced telephony from an aeroplane knows that the inevitable result of such a proceeding would be a request for a repetition. It is normal enough for the spoken word to be misunderstood when the people conversing are face to face. When the speech is double mangled en route by the transmitter and receiver the likelihood of misunderstanding becomes so alarming that all really important words have to be laboriously spelt out by the use of an incredibly clumsy phonetic alphabet. The misunderstanding of a telegraphy signal is a virtual impossibility and where messages have to be written down, telegraphy scores heavily on the grounds of both speed and accuracy.

The second point often made in favour of telephony is the fact that the people using it do not have to learn Morse. The mastery of Morse is tedious, but not particularly difficult and is a purely mechanical process. There are many men who read and send Morse for several hours daily and get less than £3 a week for it. If pilots earning the best part of £1,000 a year and more were suddenly given an ultimatum to learn Morse within a year, it would be no great hardship.

From the point of view of the wireless technician, the abandonment of telephony would be an unmixed blessing. It would simplify the transmitter considerably, the receiver to a less extent, and would save quite a lot of weight. It might be possible to improve telephony so much that perfect reproduction is obtained. The pilot in the air and the control officer on the ground may be able to converse as if in a drawing-room, but would that be a great advantage? It would probably tend to prolong conversations. The more rapid speech would tend to increase the possibility of error. In the event of misunderstanding or dispute, there would be no wireless log to prove who was right. And much more important still, unless some entirely new principle of wireless communication is discovered, telegraphy will still be required for the longer distances, the range of a telephony signal being so much shorter for a given power. The wireless operator is, therefore, still wanted and the telephony apparatus becomes a mere luxury. I do not, of course, include the wireless telephone apparatus which may, on large machines at some future time, be provided for passengers' use. But for navigational and air traffic organisation work, telegraphy fills every possible need and does so much better than the spoken word.

The most difficult case is that where the crew consists simply of the pilot and it has been taken for granted that in such circumstances telephony is the only solution. I doubt it; a comparison of the processes involved will show the fallacy of such an idea.

Convincing Comparisons

No matter whether telegraphy or telephony is used, the pilot will have to manipulate a Send/Receive switch, which is all he need do after the preliminary receiver tuning. In transmitting, he probably holds the microphone in his right hand, so he might just as well work a conveniently placed Morse key instead. In receiving messages, writing is obviously out of the question, and the wireless traffic must be restricted to the briefest possible routine signals. For a man who is accustomed to reading Morse and is really familiar with the procedure used, it is just as easy to read and memorise a couple of "Q" signals as it is to listen to and memorise some spoken words. One might justifiably claim that it is easier, because the reception of speech in the air is notoriously difficult, mainly on account of the general poor quality of telephony in air work.

When all has been said, the root cause of the whole argument is the reluctance of airline pilots to make themselves competent operators. In some cases, they have not had much opportunity of doing so. In all cases they have to learn quite a lot about flying and blind flying and engines and navigation and meteorology and instruments. Wireless operating is pretty nearly a whole-time job, and it does seem rather a tall order to expect a ship's captain or first officer to be a wireless operator as well. Nevertheless the doctor, the engineer and the lawyer, when qualifying for their professions, have to absorb far more learning than the commercial pilot is called upon to do. The unalterable peculiarity of an aeroplane is the necessity for limiting its crew.

The operating side of aviation is coming to be regarded as a profession and, combining these facts, I suggest that the professional pilot of the future—and even of the present—must and should regard absolute competence in wireless operating as one of his essential qualifications.

TWO INITIATIONS

IMPRESSIVE inaugural ceremonies were held at both Doncaster and Liverpool Airports on June 30. The Royal Dutch Air Lines (K.L.M.) were opening the Liverpool-Doncaster-Amsterdam service and North-Eastern Airways were inaugurating the link line between Doncaster and Manchester, Hull and Grimsby, while both companies were celebrating the fact that the existing line of N. E. A. to Aberdeen and Perth now links up with K.L.M. at Doncaster.

At Doncaster, guests were received and entertained by Capt. Spry Leverton and Mr. C. Kauffmann of K.L.M. and Mr. Jacques of N.E.A., whilst Lord Grimthorpe, chairman of the latter company, arrived, piloting his own machine, when the joy riding and other jollifications were at their height.

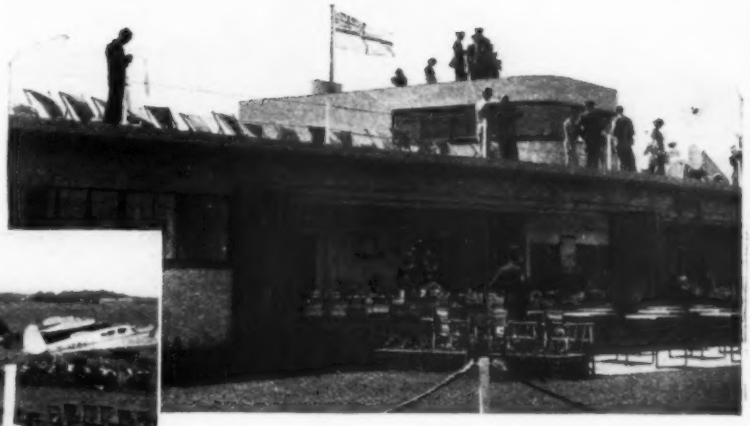
K.L.M. are using Douglas D.C 2s on the line this year and Comdr. Moll arrived at Doncaster at about 10.30 with one of these machines. He presented flowers to the Mayoress of Doncaster and explained that they had been gathered in Holland that morning. Some 150 prominent citizens from Doncaster and neighbouring cities flew in the D.C.2 and in the N.E.A. Airspeed Envoy. Guests who had flown by the K.L.M. from Holland flew on to Perth by North Eastern Airways.

Later in the afternoon the D.C.2 flew on to Liverpool, where a large crowd was assembled. Comdr. Moll again said it with flowers and the Lord Mayor of Liverpool made a short speech of welcome. Capt. Spry Leverton, replying on behalf of K.L.M., said that though traffic had not been very good during the previous season K.L.M. had faith in the public and had given of its best—the fast Douglas which enabled Liverpool people to fly to Holland and back in a day and to reach twenty-seven European cities in an easy day's flying. He hoped Liverpool would respond by filling the machines, in which case the company would put on more services and, later, even faster flying stock.

The Mayor of Wallasey then spoke, urging greater air-mindedness and pointing out that the enterprise of the K.L.M. deserved the fullest support. Short flights were then made by 150 or 160 guests in the Douglas.

The actual service, which links up with several important lines of Railway Air Services at Liverpool, started on the following day, July 1.

Ramsgate Airport Officially Opened : An Attractive Building and a Sound Operating Policy



A THANET INAUGURATION

ONE: The operation of an airport must be entrusted to a company with experience. Two: Service must be obtainable at all times and in all weathers. Three: More than enough aircraft must be available. Four: The place must be staffed by people who know their jobs and take a pride in them. Five: Complete social amenities must be available.

These, according to Mr. Whitney Straight, speaking at the luncheon which preceded the Ramsgate Municipal Airport opening last Saturday, are the essential ingredients in the recipe for successful airport operation.

Considered in regard to some airports we wot of, this conception is positively Utopian. But Mr. Whitney Straight and his co-directors, Mr. R. J. B. Seaman (of car racing fame) and Mr. F. A. S. Gwatkin, intend that Ramsgate, as soon as it gets into full swing, shall be run exactly so, in common with the other links in the chain of airports operated by the Straight Corporation.

The landing ground, with runs of between 770 and 900 yards, is admirably sited only a mile out of Ramsgate, and it is only two miles from Margate and even less from Broadstairs—which facts imply a steady tinkling of the joy-riding till.

Well Founded

Of course, as *Flight* readers know, the Ramsgate site has existed as an aerodrome for quite a number of years. It even saw duty as an airport in the days when the late Mr. Edward Hillman was inaugurating his air-travel-for-the-masses campaign. Even earlier than that, when the ground was little more than a stubble field, that sporting veteran Mr. Batchelor, now a private owner of no fewer than three aircraft (Monospar, Autogiro and Swallow), kept a machine there.

Nevertheless, when an aerodrome becomes raised to the status of a municipal airport, and when there blossoms upon it such an extremely pleasant building as that which Mr. D. Pleydell Bouverie has designed, an Official Opening is indicated.

Saturday's ceremony, actually, was not aggressively official, the sponsors feeling that a deafening fanfare does not necessarily herald ultimate success.

Lt.-Col. Sir Francis Shelmerdine, Director-General of Civil Aviation, arrived by Leopard Moth with Lady Shelmerdine to perform the ceremony. The Mayor of Ramsgate, Alderman Stead, was present, with members of the Corporation, including Councillor Huddlestone (chairman of the Aerodrome Committee) and Alderman Nixon, who (as he himself informed the company with some pride) had been the moving spirit, from 1928 onwards, in turning Ramsgate's thoughts towards airport ownership.

After luncheon, and after the speeches—which were rather scurvily treated by a loud-speaker which insisted on howling the speakers' sentiments down instead of amplifying them—the guests moved roofward, where Sir Francis Shelmerdine broke the Corporation flag—a most imposing affair emblazoned with dolphins and other such fauna doubtless indigenous to this sunny corner of England.

There followed a commendably short and well-assorted flying display. A Tipsy monoplane was followed by the Short Scion Senior, demonstrated with great *élan* by Mr. H. J. Piper; Lord Beaverbrook's Lockheed 12, which had brought its owner from London, gave a really exhilarating show in the hands of its regular pilot, Mr. Downes, who showed the crowd what a

Lt.-Col. Sir Francis Shelmerdine declares the airport open—and it looks as though Mr. Whitney Straight, like the ranks of Tuscany, can scarce forbear to cheer. (*Flight* photographs.)

sizable twin-engined aeroplane looks (and sounds) like at 220 m.p.h. and a negligible number of feet; a Moth was aerobatted in some very original ways by Mr. Symondson, a private owner from Exeter; and Mr. F. G. Miles did some positively unbelievable things with the Miles Whitney Straight demonstrator, even to the extent of rolling a wheel along the grass in the manner made famous by Mr. Kronfeld with his little Drones.

Three Service machines, in the shape of a Hind, an Anson and a Wallace, took their departure each in its characteristic manner, and the comings and goings of an extraordinarily assorted lot of visiting aircraft, suitably commented upon by a now-repentant loud-speaker, kept everyone entertained.

To round off the afternoon the guests were given joy-rides in the Scion and Dragon, which, with the Thanet Aero Club's Hornet Moth, constitute the airport's present flying equipment.

Lastly, a word on the distinctly original building. A mainly single-storey affair 125ft. long, 40ft. wide at its centre and 16ft. wide at each end, its plan form could be roughly described as an eclipse with blunted ends. A flat roof with deeply overhanging eaves gives an oddly and appropriately aerofoil-like appearance to the whole edifice. Rising from the centre of the roof is a roomy control tower, which will eventually house radio, lighting controls and other paraphernalia when air services begin to come Ramsgate's way.

A central corridor links the various rooms—booking hall, club and public restaurants and lounges, kitchen, and all those auxiliaries and ancillaries euphemistically grouped under the heading of "usual offices." All the main rooms open directly on to the terrace through folding glass doors. It is the object of the operators to serve good food, indoors or out, and thus attract even those who are not particularly interested in the *raison d'être* of an airport. Here they are very sensibly following what has been general rule on the Continent for a number of years.

Near the building are the hangar and maintenance quarters, and outside them a fuel and oil pump building from which the wares of the principal companies are obtainable. The surface of the actual aerodrome is a good one, and has recently been refertilised under the advice of the En-Tout-Cas people.

Flt. Lt. C. E. Eckersley-Maslin is airport manager, and his assistant pilots are Messrs. Pearse and Stewart.

New De Havilland Shares

AT an extraordinary general meeting of the De Havilland Aircraft Company, Ltd., to be held next Monday, a proposal will be made to increase the capital of the company to £1,200,000 by the creation of 600,000 new shares of £1 each, ranking pari passu with the existing shares. The increase in the company's activities now renders further finance necessary, and if this resolution is passed 200,000 of these shares will immediately be offered for subscription to the existing shareholders at 40s. per share.

Topical Models

ONE of the 1/72 scale "Skybird" models has already been issued by "Skybirds," 3, Aldermanbury Avenue, London, E.C.2, for the record-breaking Bristol 138a monoplane.

Imperial Airways' Share Issue

A MOTION for an injunction to restrain Imperial Airways, Ltd., from issuing 1,000,000 ordinary shares of £1 each at 30s. per share was before the Chancery division on June 28. After counsel had addressed the Court, a settlement was announced. The main ground for the application was that the shares were issued at what was alleged to be grave under-value. The settlement provided that existing shareholders should have the right to secure one of the new shares for every share held.

Blackburn Accounts

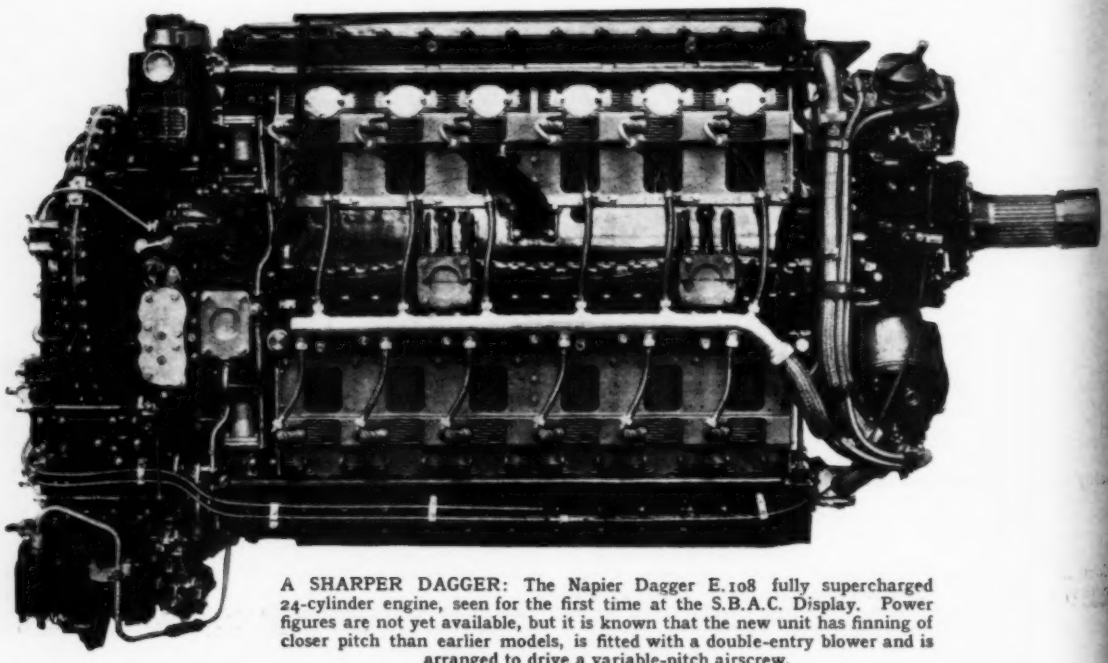
AT the annual general meeting of Blackburn Aircraft, Ltd., held recently, it was reported that the profit for the period covered by the accounts, April 2, 1936—March 31, 1937, amounted to £120,480, after providing £20,000 for depreciation and obsolescence. Out of this sum £32,500 is transferred to income-tax reserve, £8,260 to preference dividend (less tax), and out of the balance of £79,720 it is proposed to place £25,000 to general reserve and pay a dividend on the ordinary shares of 12½ per cent., leaving £19,095 to be carried forward.

AERONAUTICAL PATENT SPECIFICATIONS

(The numbers in brackets are those under which the Specifications will be printed and abridged, etc.)

(*Published July* 8, 1937.)

33789. MILLS, E. C. and HOLMAN BROS., LTD.: Water- and other liquid-cooling systems for engines and other apparatus (466,887).
34347. BENDIX AVIATION CORPORATION: Brakes (467,182).
34706. MUNRO, R. M., BINKS, C. L., and AMAL LTD.: Fastening devices for motor-car bonnets and the like (467,207).
1306. SOC. ANON D'ETUDES DES BREVETS and PROCEDES COANDA-SOC. COANDA: Propelling devices (466,959).
1307. SOC. ANON D'ETUDES DES BREVETS and PROCEDES COANDA-SOC. COANDA: Propelling devices for aircraft, road and other vehicles (466,960).
3225. HILL, H. W.: Course and speed indicators (466,909).
34442. FAIREY AVIATION CO., LTD., LOBELLE, M. J. O., and VOSS, E.: Cockpit covers for use on aircraft, motor boats and ships, and in similar positions (467,153).
2325. GABA, A. E.: Variable-pitch airscrews (467,020).



A SHARPER DAGGER: The Napier Dagger E.108 fully supercharged 24-cylinder engine, seen for the first time at the S.B.A.C. Display. Power figures are not yet available, but it is known that the new unit has finning of closer pitch than earlier models, is fitted with a double-entry blower and is arranged to drive a variable-pitch airscrew.